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ABSTRACT

Since 1988, state governments have been required to collect quarterly from private sector employers gross earnings by Social Security numbers, industry of employment, and county of employment. A study was conducted of 13 states' efforts to use this wage record database as a tool for improving educational accountability and assessing the impact of education on the work force. Two arguments for using this tool to track the performance of vocational education graduates and leavers are as follows: (1) the potential high quality of the data and (2) the significant cost savings, compared to traditional ex-student and employer follow-up surveys. The states involved in this study were Alaska, Arizona, Colorado, Florida, Illinois, Indiana, Missouri, New Hampshire, Oklahoma, Texas, Virginia, Washington, and Wisconsin. State profiles examined the ongoing systematic use of unemployment insurance wage record data, whether feasibility or exploratory work for systematic use was completed or underway, and whether feasibility or exploratory work was uncertain. The following conclusions were reached: in most states, use of these data was a significant improvement over traditional follow-up studies, particularly in cost savings; several states were using or planning to use the data as broad indicators of education and training accountability, beyond Perkins mandates; and the development of safeguards to protect the confidentiality of individuals and employers was a major concern. (Appendices contain the following: (1) federal guidelines for income and eligibility verification; (2) the telephone interview protocol used in the study; (3) a framework for application of unemployment insurance wage data to vocational educational assessment; and (4) and a list of states and persons contacted and documents reviewed during the study. There are 28 references.) (CML)

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EMPOWERING ACCOUNTABILITY FOR VOCATIONAL-TECHNICAL EDUCATION: THE ANALYSIS AND USE OF WAGE RECORDS

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PREFACE

Through this monograph the authors seek to inform the educational community, particularly vocational educators at the state and local levels, of a potential resource for responding to additional demands for accountability. That resource is the nation's unemployment insurance wage reporting system. The research presented herein focuses upon the use of this system by thirteen states to follow-up on former students in order to gain a picture of the post-education employment and earnings history. Administrators and others engaged in evaluation and accountability efforts will find this information to be useful in planning new initiatives to strengthen assessment, program evaluation, and federal reporting.

In this report, "accountability" is used as a broad construct to encompass evaluation of policy, programs, and services at both the state and local levels. Recently, the new mandates of the 1990 Carl D. Perkins Vocational and Applied Technology Education Act Amendments, along with other educational reform initiatives, call for increased attention to the documentation of program and student outcomes to ensure that educational efforts are indeed achieving their intended impact. Traditionally, accountability has focused on ensuring that state boards and local recipients of funds expend money in ways consistent with the purposes of the Perkins Act. However, it is imperative that the vocational education community adopt a view of accountability which is broader in focus and examines student, program, and fiscal outcomes at levels ranging from the classroom to the state legislature. With a broadened perspective of accountability, the prospects of developing a world-class American workforce, through better instruction as well as adequately funded and coordinated programs, are significantly improved.

This report illustrates several of the major efforts commissioned in recent years by state boards of vocational education to explore the feasibility and utility of using the unemployment insurance wage record system. These case studies in thirteen states provide a rich anthology of efforts to explore post-program employment, earnings, and other experiences of vocational education students in relation to programs in which they were enrolled. This study was not intended to be a comprehensive analysis of all efforts nationally regarding the use of wage records in vocational education. The design of the study sought to inform state and local officials regarding some of the most extensive

effort in illustrating states to utilize Unemployment Insurance (UI) wage records. Understanding the efforts of various states is particularly valuable as the use of performance measures and standards in vocational education programs is inaugurated nationally.

The first section provides a backdrop for those desiring more information regarding accountability, new challenges in performance assessment, establishment of performance standards systems, and what role the UI wage records might play in assisting vocational educators develop those standards and measures. Readers primarily interested in what states have done in their efforts relative to UI wage records are directed to the second section where state by state descriptions are presented and detailed. The third section presents an overview of what all the states accomplished and presents the findings, conclusions, and recommendations for future use. The redundancies are intended to facilitate reading of the report on the part of different individuals with varied interests.

During the conduct of this research, concurrent efforts were underway by various individuals and organizations also interested in the UI wage record system. The authors wish to thank them for sharing information and offering advice. These include staff of the National Commission for Employment Policy, the National Governors' Association, the National Center for Research in Vocational Education (NCRVE), the National Occupational Information Coordinating Committee, and the U.S. Department of Education. Interested readers should watch for reports and handbooks to be published in the near future.

Crucial to the success of the project were those persons in the states studied who provided so much of their time and talent to this effort. Without their support, interest, and advice, neither the research nor this report would have seen the light of day. They are identified in Appendix D and our sincere appreciation goes out to them.

Lastly, Robert H. Meyer and Robert P. Sorensen, both of the University of Wisconsin at Madison, provided their expertise along with continual support and encouragement at all stages of the research. They also contributed greatly to the final review process. Additional reviews were obtained from Franz Backus of the Wisconsin Department of Industry, Labor, and Human Relations; Jay Pfeiffer of the Florida

Educational and Training Placement Information Program; David Stevens of the University of Baltimore; and a NCRVE unidentified reviewer. Their familiarity and knowledge of the UI wage records and their possible applications to performance outcomes contributed immeasurably to the conduct of the study and to the final report. We wish them well in their future endeavors. Although many people contributed significantly to our efforts, the authors take full responsibility for any errors and most omissions.

INTRODUCTION, BACKGROUND, AND PROCEDURES

Introduction

An integral aspect of the educational reform movement has been an intense interest in assessing the quality, productivity, and effectiveness of both current and new educational endeavors. In July 1990, following the declaration of the national education goals in September 1989, the National Goals for Education Panel was appointed and charged with assessing the nation's progress toward achieving the national goals. Moving toward these new educational outcomes requires policymakers and educators to have a clear picture of both the current levels of student achievement (i.e., a benchmark), as well as definitive goals for educational institutions and student achievement. The establishment of new goals for the nation's learners requires new assessment strategies.

Under the Constitution, education is primarily a state responsibility. Given the widely differing views on the aims and purposes of education and state and local resources committed to those aims, it is understandable why the nation lacks common national measures or standards for many educational phenomena. As the inaugural report of the National Goals for Education Panel (1991) conveys, there are many facets of specific goals about which we are still largely ignorant. As the report suggests, a critical need exists for "state and national data on how well the knowledge, skills, and attitudes of American workers compare to those of workers in other nations, especially those that are our prime economic competitors" (p. 15).

Among the various strategies that should be considered for improving educational accountability and its impact on the workforce is the use of a wage record database (Crosslin & Stevens, 1989). Since 1988, state governments have been required to collect on a quarterly basis the following information from private sector employers: gross earnings (by social security number), industry of employment (by Standard Industrial Classification), and county of employment. (However, many states had wage reporting systems prior to 1988. In fact, in 1984, only eight states did not do wage reports.) The use of social security numbers in this data system is potentially an invaluable resource for tracking students' experiences and success in the labor market. When compared with other longitudinal databases such as the Census, federal or state Internal Revenue information (Strong & Jarosik, 1989), state-level higher education databases (Smith, 1989), or national longitudinal studies in education (Hoachlander, 1989b), a wide array of important policy

questions can be asked about the performance of former vocational education students, both graduates and leavers. The potential high quality of the data included in the UI wage records and the significant cost savings in obtaining the information (compared to high costs of traditional graduate and employer follow-up surveys) make careful consideration of this option particularly important.

In response to the growing national interest in the UI wage records to address vocational education accountability concerns, this project focused on the following three objectives:

1. To describe the efforts of selected state boards of vocational-technical education that have developed and experimented with strategies for accessing, analyzing, and reporting the UI wage record data.

2. To describe the substantive and technical issues associated with the database (e.g., coverage and content of the wage record data, accuracy of the records, privacy concerns, useful analyses of employment and educational data).

3. To prepare a technical report providing a summary of the project procedures and findings, including recommendations for national, state, and local administrators and policymakers.

Background

Accountability

Accountability is pervasive in most discussions of American education today and vocational-technical education is not exempt from the dialogue. Legislators, policymakers, tax payers, and educators themselves are calling for increased accountability for all social programs. Vocational educators have long attempted to "prove the worth" of their programs in a variety of ways. Today, the demand for that accountability will require more coordination and greater leadership from federal and state officials, as well as from the vocational education community. McDonnell and Grubb (1991) have noted the following:

> The growing emphasis on accountability in all aspects of American life, from the on-time departures of airlines to hospitality rates, is likely to make performance standards an increasingly prominent feature of education and training policies. . . . As a result, the challenge for future policy design will

> not be to craft a single instrument intended to eliminate slippage on a few narrowly defined measures such as program cost and short-term job placement, but to combine a variety of instruments in ways that will create incentives for local education and training institutions to advance the goals of preparing individuals for productive employment—including widespread accessibility of services and the acquisition of skills that enhance long-term job opportunities. (pp. 53-54)

These goals for vocational education are important in the consideration of accountability and in the formulation of public policy. Traditionally, vocational education programs have utilized training-related employment (i.e., job placement) as evidence of the effectiveness of a given program or institution. However, it is also recognized that such concepts are not always useful. Several studies have noted that demographic factors associated with various screening or sorting methods of students for entry into the wide variety of work-related education and training programs account for many of the differences in postprogram employment status, job retention, and earnings enhancement (McHugh & Stevens, 1989, p. 34).

In secondary schools, the current educational reform movement suggests that all students need to be adequately prepared to compete in a global, technologically intensive economy. The recent report of the Secretary's Commission on Achieving Necessary Skills (SCANS) (1991) contends that *all* high school graduates need expertise in using resources and information effectively, manipulating systems and technology, and using expanded interpersonal skills such as problem solving and teamwork. Developing new and more precise measures of these skills in work settings will be crucial in evaluating the effects of both vocational education programs along with more general education enterprises. Moreover, the philosophies of programs and of administrators shift and vary so that employment may or may not be a significant indicator of success in all cases:

> Vocational educators, and to a lesser degree providers of employment training, have often objected to the exclusive focus on labor market outcomes. A variety of factors beyond their control affect labor market outcomes. Hence, they argue, holding them accountable for employability rather than employment would be more appropriate for judging program success. Employability means having the necessary skills to perform effectively on the job, regardless of whether employment opportunities are immediately available. Consequently, assessing employability requires attention to a set of learning outcomes, for which service providers can assume greater responsibility. (Hoachlander, 1989a, p. 3)

Lastly, others would argue that for vocational education to be truly accountable it must be viewed within the larger context of education and society and not as an isolated program reporting a placement rate of "72% six months after graduation." The contributions of vocational education to overall educational attainment is an important consideration. As David Stern (1988) notes:

> In using data on employment or earnings to measure aggregate outcomes of Postsecondary Vocational Education (PVE), there should be some attempt to estimate net effects. This means trying to estimate how many non-participants in PVE would have been placed in jobs taken by PVE graduates, and what happens to the non-participants' employment, earnings, and expressed job satisfaction. In attempting to measure how much PVE improves access of under-represented groups to certain occupations, it would be desirable to find out whether people displaced by PVE graduates are themselves members of under-represented groups. Failure to make such corrections seriously reduces the value of labor market outcomes as indicators of program success. (p. 14)

All levels of public policy development directly affect vocational-technical education. Hence, it is important for vocational-technical education to recognize the demands for accountability at the federal, state, and local levels and meet them head-on:

> lawmakers will continue to respond to the nation's changing needs through targeted spending. Congress can achieve greater economy and equity in programs and improve its own stewardship of public resources if it chooses targeting language with appreciation of the capabilities and possible limitations of existing data at the national and local levels and with recognition of the periodic need to add new elements to data sources. It can make great strides in rationalizing the policymaking and policy implementation process if members begin now to construct a better labor market information system for the future. (Stevens & Duggan, 1988, p. 22)

Assessing Educational Performance

Foremost among the changes called for both within and outside of educational circles in the name of accountability is the establishment of performance assessment systems for education. Rather than evaluations based upon educational inputs and processes, system performance or outcomes are seen increasingly as the key to educational reform and improvement. The Total Quality Management in the private sector places particular emphasis on program outcomes or the "bottom line." Many educators translate this approach as requiring extensive student assessment as a basis for improving the

accountability, management, cost effectiveness, and ultimate performance of public programs.

Many vocational educators would argue that performance monitoring of outcomes has occurred throughout the history of vocational education and point to the use of job placement rates as the prime indicator. However, the concept of performance standards and assessment goes well beyond this premise:

> While there is much variation in the way the States have approached the design and management of change, overall "accountability" has become a guiding principle. Schools are expected to act like businesses, and account for their successes and failures; and though it has never been very easy to apply quantitative measures to complex educational processes and outcomes, more and more school systems have been doing just that. In many places, performance measurement has become a basis for incentives or sanctions directed at various levels of the educational system. For example, merit pay for teachers is an attempt to reward teachers for superior performance, while so-called "bankruptcy" laws penalize school districts for poor performance by transferring their assets and liabilities. (Office of Technology Assessment, 1989, p. 11)

While this study addresses the issue of performance from an administrative perspective, there are multiple uses for the performance information currently being considered. According to Brown and Choy (1988), the quality of information available to consumers (i.e., parents and students) who wish or need to make educational program choices has become a critical issue as well:

> Disclosure of information on outcomes could protect students from the kind of abuses discovered in the GI educational allowance and Guaranteed Student Loan programs. If students were provided with outcome information such as completion rates, job placement rates, and entering wage rates for different programs and institutions, they could avoid programs that offer them little (return) for their investment of time and money. (p. 4)

More information on student outcomes from selected programs could help students make the best choices for themselves from available options. Currently, students are required to choose schools with limited objective information about the quality of programs and support services such as job placement. Program and institutional evaluation results and other information collected by the state or individual institutions are rarely available to the public.

To date, performance-based approaches to accountability have been utilized in the Job Training Partnership Act (JTPA). Since the mid-1980s, Congress has seen the JTPA as an experimental opportunity and is now extending the use of performance measures and standards to a number of federal social and education programs, including welfare, adult education, and vocational-technical education. Several insights regarding the implementation and use of performance assessment systems have emerged from the JTPA experiences. Most notable is the concern that the use of performance standards tends to create "creaming" in the selection of participants. In order to assure reaching outcome standards, there is a natural inclination to enroll only those students who are most likely to show high levels of attainment at the end of the program. Apling (1989) offers the following additional insights from the JTPA experience:

- the influence of performance standards on the type of training provided with a danger that effective—but long term and expensive—services will be discouraged in favor of short-term and inexpensive approaches;
- the difficulty in meeting multiple standards, some of which may not be mutually compatible;
- the problem of adjusting standards for programs in different labor markets or serving different types of clients; and
- the difficulty in setting minimum standards.

> Experience from performance standards in other program areas indicate that, unless carefully designed and implemented, standards may not improve performance and may have undesired effects. (p. 18)

The use of performance-oriented approaches to achieve accountability is multifaceted. The challenge confronting educators, and vocational educators in particular, is one of devising a set of performance measures and standards which provide useful ways of monitoring the federal, state, and local investments in rapidly changing vocational-technical education programs.

Vocational Education Performance Standards

The recently passed Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 requires each state receiving funds under the Perkins Act to develop and implement a statewide system of core standards and measures of performance for secondary and postsecondary vocational education programs (Sec. 115[a]). Among the core standards and measures addressed in the Perkins Act is "placement into additional training or education, military service, or employment" (Sec. 115[b][2][D]). As mentioned

earlier, vocational education has long concerned itself with "job placement" as an outcome. However, the issue of placement needs to be revisited in the light of accountability, performance standards, and educational reform:

> Vocational educators object to evaluating their programs on short-term placement and employers' initial satisfaction, because PVE (postsecondary vocational education) is rightly intended to give students a variety of skills that will increase their productivity as their careers advance. Chasing job vacancies may distract PVE programs from their public purpose of improving employees' productivity. The tradeoff between achieving high placement rates and improving long-term productivity is more acute if placement is supposed to be "related to training" because, if PVE programs focus on giving their graduates an edge in competing for a narrow range of jobs, they will presumably emphasize a narrow set of skills at the expense of more generally applicable skills and knowledge. More narrow training may not make PVE graduates as productive in the long run if they do stay in jobs related to their training and, by definition, it will not pay off as much as broader training if they take jobs in other fields. (Stern, 1988, p. 13)

Just as the above refers to postsecondary vocational education, similar arguments are advanced for vocational education programs at the secondary level such as the following observations by Hoachlander (1989a):

> the single-minded focus on employment outcomes is inappropriate. While labor market outcomes are a necessary indicator of the effectiveness of vocational education, they are not sufficient. Many factors other than the quality of a particular program affect a student's employment history. Economic conditions, family formation, personal interests, motivation, and alternative opportunities all figure into what students do after participating in vocational education. Under the right economic conditions, for example, graduates of very poor programs may all do very well in the labor market, at least for a few years. (p. 16)

Given the constraints of job placement outcome measures, the search for accurate, reliable measures and standards for evaluating vocational education continues. However, the development of labor market outcomes remains a critical issue. According to Hoachlander (1989b),

> The major difficulty in using labor market outcomes to assess program effectiveness lies in isolating outcomes that may truly be attributed to the effectiveness of a program from those that result from factors beyond the control of the program. Two obvious external factors are general economic conditions and student characteristics. If completers of different programs face different economic conditions, comparisons of unadjusted labor market outcomes will not yield accurate comparisons of the relative effectiveness of the programs. Similarly, programs that serve students with different characteristics may realize different labor market outcomes that have little to

> do with program effectiveness. For example, a (skilled) trade program that serves mainly women may have lower placement rates than a similar program that serves mostly men. This is not because the program is inferior, but because its graduates continue to face discrimination in the labor market. Evaluations of program effectiveness in terms of labor market outcomes, therefore, must distinguish programmatic effects from outcomes that result from factors beyond the control of the vocational education or employment and training program. The inclusion of good statistical controls will help to achieve this distinction. (p. 5)

Data collection on outcomes is of primary concern to those responsible for the development of systems of performance and evaluation. However, acquiring high quality outcome data from existing information sources is problematic.

> For rigorous, mid- to long-term follow-up on the impact of participation in vocational education, the national longitudinal studies will remain the best sources of data. They cannot be topped for detail over time on student characteristics, education, family formation, and employment history. The primary problems with the longitudinal studies stem from sample size. It is not possible, for example, to conduct follow-up for small to medium sized programs. Nor is it possible to make comparisons among states or types of delivery systems. (Hoachlander, 1989a, p. 28)

Data collection within states causes some additional, special problems for vocational educators interested in placement outcomes:

> While there is growing evidence that appropriate performance criteria can be defined, measured, and linked to funding, obtaining accurate, timely, inexpensive data has posed major problems. Employment training programs, because they work with smaller numbers of clients than vocational education and because they have limited follow-up to relatively short periods following program completion, have successfully collected data on placement. Large scale, longer term efforts at tracing the labor market outcomes of participants in either postsecondary vocational education or employment training have not been successful. (Hoachlander, 1989b, p. 32)

Further, in most states the follow-up job placement is not considered the primary criterion for a secondary vocational education program.

However, a potential side benefit of successful implementation of performance standards in vocational education might be closer relationships with employment training programs. As Butler (1988) notes, it may be possible if vocational education continues to move in the direction of outcome-based management:

> for the two systems (vocational education and JTPA) to become more integrated with each other. Those of us who work in one part of the field or the other may understand the distinctions, but the general public does not, and certainly Congressional and state legislators who ultimately make the policies and vote on whether and to what extent to fund them are not comfortable that one hand knows what the other is doing. Moving both systems in the direction of outcome-based programming and management may bring the two closer together to the benefit of both. (p. 22)

While developmental problems certainly appear in the forefront when discussing the impact of performance standards in vocational-technical education, one must not lose sight of the local nature of the implementation of such a system. Full utilization of the results of the system and systemic program improvement will only result when all facets of a performance-oriented system are incorporated fully by administrators and professionals (i.e., "buy-in occurs").

Historically, the vocational education community has been called to respond to various accountability demands. Because such a significant share of the resources and conceptual direction for vocational education programs is found in federal legislation, the accountability expectations for these "special" funds have always been high in the minds of employers, taxpayers, and policymakers. Performance standards are another and maybe the last in this long history of federal mandates:

> while the collection of vocational education data has been beset by a number of false starts with unsatisfactory results, it is important to keep in mind that Congress has asked much more about vocational education than any other component of equal size in the secondary and postsecondary systems. Questions that on the surface would seem straightforward have, in fact, been quite complex. Had they been asked of other parts of the secondary and postsecondary curriculum, they would have proven equally difficult to answer. It is important to remember, therefore, that the problems that have plagued the collection of data on vocational education are not unique to it; rather, they are endemic in the larger systems we use to organize and account for secondary and postsecondary education. (Hoachlander, 1989a, p. 35)

However, in response to the call for increased educational accountability and the establishment of performance standards for vocational education, the identification of cost-effective labor market outcomes remains a key issue. A recent study by the Office of Technology Assessment describes several of the possibilities that now exist for collecting and analyzing new information which will make the establishment of performance standards both feasible and cost effective.

Recent improvements in the quality and cost of data collection and storage, made possible by mandated changes in employer reporting of wage and earnings data, provide partial relief for these concerns (e.g., validity of follow-up information provided by students, high cost of conducting follow-up studies) and increase the feasibility of designing cost-effective labor market outcomes indicators. In particular, the use of wage records maintained by the states in compliance with recent amendments to the Social Security Act could be a first step toward improved labor market indicators of program performance. The wage records data is more accurate than self-reported survey information, allows for longer-term evaluations of employment, and can be merged with other data such as military records and computerized school transcripts.

There remain some important technical issues to be resolved before the wage records system could be implemented for secondary vocational program evaluation. First, school transcript information is not uniform, despite recent efforts to standardize vocational course definitions and curricular offerings. In addition, clarification of confidentiality restrictions pertaining to individual financial data, and the decision to maintain long-term archives of earnings and employment data, would be minimal prerequisites to implementation of wage records system for performance evaluation (Office of Technology Assessment, 1989, pp. 4-5).

Unemployment Insurance Wage Record Data

Each state requires civilian employers to report on a quarterly basis, and under various names (e.g., wage records, unemployment compensation records), earnings of all employees (together with their social security number). (A detailed description of the database is included in Appendix A of this report.) This database, for all practical purposes, serves as a quarterly census of wage records. In addition to its principal use, that is, in the administration of the unemployment insurance or compensation laws, other uses have evolved. Some states operationalize this employer "universe" for wage surveys undertaken for labor market information. Use of this database to track completers and/or leavers of specific social programs, including job training and education, has been discussed for several years. Indeed, testing of the system for these secondary purposes has taken place and considerably more attention is focused on potential uses of the database, specifically to assess student outcomes of vocational education.

One of the most prominent examples of a federal program which could employ wage record data to improve accountability is vocational education. The Perkins Act states that the objective of vocational education is to enhance the productivity and labor market success of its students. Serious consideration must be given to establishing and funding an adequate and functional accountability system for vocational education programs. One major purpose of such an accountability system would be to induce a reconsideration by the states of the way they fund local vocational education programs (Bishop, 1989, p. 19).

For many, the traditional measures of performance outcomes (i.e., follow-up studies of graduates) simply do not prove satisfactory:

> The major barrier to implementing performance measurement in vocational education and in other programs has been the unreliability and inappropriateness of the performance measures currently available. Training-related placement rates, currently reported to state department of vocational education (in some states), are not comparable across districts and programs. In addition, they are subject to manipulation and suffer from a nonresponse problem. Archived UI wage record data would be extremely valuable here. Estimates of the earnings impact of vocational versus general education can be obtained rather easily by merging wage record data with school files on curriculum, grades, and the test scores of students. (Bishop, 1989, p. 20)

To date, most of the exploratory research associated with the Unemployment Insurance (UI) wage record database has focused on the labor market performance of youth adults completing programs funded by JTPA. A recently completed feasibility study of using UI wage records to evaluate JTPA revealed the following:

- The use of UI wage-record data would enable detailed analyses of the long-term employment and earnings patterns of JTPA terminees.
- UI wage-record data offer great promise as a resource for studies designed to measure the net impact of employment and training programs.
- UI wage-record data is a cost effective means for obtaining pre- and postprogram employment and earnings information on JTPA participants. (Baj, Trott, & Stevens, 1991, p. ii)

This same study suggested that four major issues must be addressed in the strategic decision at the national level whether to use the UI wage record system as a tool for monitoring and evaluating training programs. These issues included technical feasibility and costs, both of which have proven to be adequately addressed in pilot studies to date.

Procedural differences among states could be reconciled through Congressional leadership. Finally, the "political will" to stimulate change and innovation is also a federal responsibility (Baj et al., 1991, pp. 95-96).

Use of the UI wage record data provides an unique opportunity to do studies of a longitudinal nature, which heretofore have been extremely difficult and costly to undertake in education. Over time, this data could provide some extremely useful information on the effects of vocational-technical programs on numerous labor market behaviors. According to Brown and Choy (1988), among the important effects and variables to examine are (1) longitudinal earnings and employment profiles, (2) job mobility within industries and states, and (3) pre- and postprogram earnings (p. 23).

There is also a significant potential for researchers or policymakers to create comparisons groups through statistical manipulations with Census data and hence have an additional vehicle by which to assess the performance of vocational education. Bishop (1989) provides an example of a potential analytical model for assessing the impact of vocational programs:

> A year after the student leaves school, and periodically after that, wage record data on employment, quarterly earnings, establishment size, and industry could be merged with the confidential record containing measures of the student's academic performance prior to entry into vocational education. An analysis would be conducted of this data and a model developed predicting the earnings of those not attending college. The computer could then generate a predicted earnings and employment profile for each noncollege-bound student based on the actual outcomes of the high school's noncollege-bound students who did not pursue a vocational curriculum. The mean difference between these predictions, and the employment outcomes realized by the school's vocational students would one of the factors considered when assessing the effectiveness of a school's vocational program. Mean differences would be calculated for students grouped by the number of courses taken, by field of specialization, by whether the student graduated and by grades in vocational courses. (p. 20)

Although the development and utilization of the UI wage record data is a function of state government, some researchers have called for a national archiving of the data so that national studies could more easily be conducted. This concern would certainly be applicable to the concerns of vocational-technical education as well. However, since the Perkins Act requires states to develop their own systems of performance standards, states may discover unique advantages in using the UI wage record system of their own state, foregoing interstate comparisons:

> While there is clear interest nationally in determining effective policy and program approaches, the need to act on the information is more pressing at the state level. This particularly true in education. Archived, quarterly employment and earnings data would permit states to evaluate program effectiveness across programs, including vocational education, job training, job placement, and others. . . . Further, as states become more involved with customized and industry-specific training—under JTPA Titles II and III, as well as vocational education—they would be able to document the impacts of each over time, compare public and private sector effectiveness with various approaches and make appropriate program modifications. (King, 1989, p. 7)

State agencies responsible for managing the UI wage record information are sharing this data for a variety of reasons, most unrelated to education and training. Forty-one states responded to a 1988 survey initiated, conducted, and compiled by the Wisconsin Department of Industry, Labor, and Human Relations, Unemployment Compensation Division (1988), which attempted to secure information regarding individual state's data sharing efforts of its UI wage record reporting system. Ninety-three percent or thirty-eight of the responding states indicated that they share wage record data with other state or federal agencies, those most often cited being the state agency responsible for Health and Social Services, the Internal Revenue Service, and the State Department of Revenue. Four states reported sharing this information with education agencies (p. 1).

Rising costs and concerns regarding confidentiality and security are critical concerns for state agencies as data sharing requests grow. Another potential inhibitor to expanded utilization of the wage record data for use in performance outcome measurement is the lack of understanding regarding the appropriate use of the data.

Discussions among state agency personnel at the Northeast-Midwest Institute LMI Forums revealed a tension between data producers who are not funded to offer extensive technical assistance to data users. The latter group includes LMI consumers who are not able to spend the time that would be necessary to acquire a working understanding of the technical aspects of the data sources. This creates an understandable caution on the part of LMI producers, who are reluctant to release information that they suspect will be misused. Simultaneously, frustrated consumers complain about the lack of cooperation exhibited by the producers. In a paper presented to a recent national LMI annual meeting, David Stevens (1989) argues,

> There is a critical need for capacity building in both the producer and consumer arenas. It is penny wise and pound foolish to consciously allow

> the quality and availability of information to deteriorate at the very time when target efficient management in both the public- and private-sectors is required. (pp. 7-8)

Duggan (1988) offers the following advice for state and local education policymakers on this issue:

- Understand what LMI reveals about the directions of the state's economy and the training and education needs of the current and future work force. Learn how to use LMI in education policymaking.
- Give serious thought to the weaknesses in data conceptualization on the "supply" side of the employment equation. Design education data programs that will earn the same reputation for statistical quality and reliability as the BLS programs. (p. 29)

Utilization of the UI wage record information data holds promise for improving accountability in vocational education. Some states are already tapping this resource—as will be revealed in the balance of this report. While perhaps not a panacea, the UI wage record files represent a tool for vocational education leaders and policymaking in evaluating and improving programs. As Hoachlander (1989b) notes:

> In short, the unemployment insurance files provide a promising low-cost approach to obtaining current, accurate, and fairly comprehensive data on some selected labor market outcomes for students participating in vocational education programs. The approach is far from perfect and would benefit from a few modifications that do not appear to be burdensome or expensive. Certainly, the information and coverage is far superior to the follow-up efforts attempted by the Vocational Education Data System. While this method lacks the precision and detail of the larger national longitudinal studies, it provides an economical alternative for obtaining institutional and statewide data on an annual basis. Thus, potentially good data is available on labor market outcomes for participants in postsecondary vocational education and employment training programs. (p. 37)

Procedures

As noted earlier, this study sought to describe the pilot and demonstration efforts of thirteen states that had utilized the UI wage records in evaluating some aspect of their vocational education program The strategies employed in this study included conducting a comprehensive, ongoing literature review; a brief questionnaire survey mailed to state directors of vocational-technical education; summary and analysis of information provided by thirteen states; and in-depth telephone interviews with key state agency personnel responsible for conducting the activities and studies linking vocational education data with the UI wage record data system.

Over the past two years the literature on the use of wage record data has become voluminous. Much of this literature has been generated by various groups associated with implementation of JTPA programs. Several initiatives have been undertaken by states using the UI wage record data to assess the impact of JTPA programs. The National Governors' Association (1992), among other groups, have urged the U.S. Department of Labor to measure the labor market performance of former JTPA trainees. In addition to other sources, the National Assessment on Vocational Education (NAVE), which was completed in 1989, commissioned a series of papers which examined several alternatives for improving the assessment of labor market and further education and training outcomes of former students, including tracking students through computerized data systems.

In January of 1991, a brief memorandum was mailed to each state director of vocational-technical education. The directors were asked to indicate whether or not efforts in their state had been undertaken to explore, develop, or conduct research on student follow-up utilizing one or more of the following automated databases: (1) UI wage reporting, (2) income tax data, (3) social security, or (4) social services. State officials were also asked to return any reports or written materials that would describe their efforts in this arena.

Of the fifty-three states and territories, twenty-six (49%) responded affirmatively, indicating they had or were examining the UI wage record database as a tool for evaluating the labor market effects of vocational-technical programs.[1] Overall, a total of thirteen states

[1]In a survey recently conducted by the National Center for Research in Vocational Education at the University of California at Berkeley, nine states on the secondary level and thirteen states on the postsecondary level reported having used unemployment insurance data in the past to report on student

were identified as having conducted recent studies which involved the UI wage record database. Since responses were sought only from those states that had undertaken significant studies (i.e., an effort which, at minimum, had produced a report), it was assumed that nonresponding states had not reached an in-depth level of consideration.

The reports, memoranda, and related information submitted by each of the states were reviewed and analyzed by members of the research team. Most of the projects reported by the states were feasibility studies intended to examine the utility of using the UI wage record data system for tracking employment, earnings and whether the employment taken by former students was training-related. From the information provided, a two- to three-page state profile was prepared describing each state's initiative. The state case profiles, which are presented in the following chapter, describe the purpose and parameters of the investigation, the employment and educational data used, the analyses performed, some of the primary findings, and the major conclusions and recommendations emerging from the project.

As the state case profiles were being compiled, a detailed interview protocol was developed. The purpose of the in-depth interview was threefold: (1) to obtain a review of the case profile by a knowledgeable state official to ensure that it was accurate and complete, (2) to obtain perspectives on any future plans for using UI wage record data in vocational education accountability systems (e.g., the system of performance measures and standards required under the Perkins Act Amendments of 1990), and (3) to gain detailed information on a series of critical issues surrounding the use of the UI wage record data (e.g., assurances of confidentiality, reliability and validity of the UI data, crosswalking employment codes with curriculum/program data, and the availability of uniform data on vocational education such as completers and programs). The telephone interview protocol is presented in Appendix B.

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perf[illegible]mance. Additionally, sixteen (secondary) and nineteen (postsecondary) states respectively reported that they were considering using the data source in the future. See Hoachlander and Rahn (1992, A-1, A-2).

STATE PROFILES

The thirteen states addressed in this study are presented in the following classifications:

Group 1. Ongoing Systemic Utilization of UI Wage Record Data

Group 2. Feasibility or Exploratory Work Completed/Planning Underway for Systemic Use

Group 3. Feasibility or Exploratory Work Completed/Future Development or Use Uncertain

Ongoing Systemic Utilization of UI Wage Record Data

Four states have been identified as having made major strides in the use of UI wage record relative to vocational education programming. *Florida* is a pioneer in this area and maintains the most sophisticated system. *Washington's* Community College System has developed innovative uses of the UI wage record file information and has cooperated with neighboring states in securing additional wage records. *Alaska* actively promotes the utilization of its UI wage records among a variety of educational and training programs and provides services upon request. Finally, *Colorado* has been building up a longitudinal profile of its graduates and shares the information with its colleges.

Florida

Florida is indeed a pioneer in computer matching of data files. In addition to the UI wage record files, it matches student records with higher education, state administration corrections, and the following federal agencies: defense, personnel management, and the postal service. Florida state law requires compliance with a certain placement rate and also establishes the Florida Education and Training Placement Information Program. It has been demonstrated that the Florida system is relatively inexpensive.

Clearly, a pioneer in the utilization of automated databases to assist in the assessment of educational programming, the Florida Education and Training Placement Information Program began as the Occupational Identifier Project. It was formed in 1984

both under a legislative directive and a joint agreement between the Florida Department of Education and the Florida Department of Labor and Employment Security and supervised the by the State Job Training Coordinating Council with the Florida Advisory Council on Vocational Education serving in an advisory capacity. The project was developed to address a legislative directive enacting a placement standard for public vocational education job preparatory programs. The standard requires that seventy percent of all program completers obtain employment which is related to their training. "Training-related" is defined as conditions in which former students

- obtain employment utilizing skills or competencies acquired through training;
- continue their education; or
- enlist in one of the uniformed military services of the United States.

The 1989 Florida Legislature established the Florida Education and Training Placement Information Program as the Department of Education's primary source for the collection of student follow-up information, especially with respect to collecting the data by computer matching. The program provides comprehensive, reliable, and cost-effective follow-up data on former Florida students through civilian employment, continuing education, and military data via automated databases.

The Placement Information Program relies on the cooperation of Florida's State Departments of Education, Labor and Employment Security, Administration, and Corrections, as well as the following federal agencies: Department of Defense (former students enlisted in the military), Office of Personnel Management (former students employed by the federal government's career service system), and the U.S. Postal Service (former students employed with the postal service).

Three policy issues are addressed by Florida's Placement Information Program. First of all, as cited earlier, Florida statutes require that seventy percent of vocational education program completers are placed in training-related situations. The program provides the accountability information to both state and local decision makers to address the standard. Second, prior to the establishment of the Placement Information Program, many diversified requests were made of both employers and former students for follow-up data. This program consolidates such data collection activities utilizing consistent collection

standards and definitions. Third, it is a goal of the Placement Information Program to develop a system of consistent core measures and standards for any public/private program where education and employment goals are outcomes.

The advantages that the Florida Education and Training Placement Information Program identifies for this crossmatching system are

- *comprehensive*—Consolidated data collection eliminates the need for former student employment surveys and studies done at public expense; minimizes paperwork, and, consequently, reduces employer contact and cumbersome surveys;

- *relatively inexpensive*—With the program's approach using record matching to obtain information, the cost for each item of information decreases per unit as one seeks more information;

- *very accurate*—Placement Information Program data actually reflect what a former student was doing at the point in time used as a reference; and

- *comparable with other data resources*—The program's approach uses the same program and occupational nomenclature used in other information resources.

In its latest annual report (August 1990), a total of 196,665 former students enrolled during 1988-1989 were studied. These former students completed job preparatory vocational education programs in district secondary and postsecondary schools, community colleges, and state correctional institutions. The database includes former students in other selected educational and training programs such as migrant, exceptional education, displaced homemaker, single parent, and law enforcement education programs. Sixty-four percent of these former students were employed in over forty-two thousand Florida businesses, twenty percent were continuing their education as either part- or full-time students, and two percent were employed with the federal government or in the military.

The same annual report also displays a work flow chart (see Graph 1) of the Florida Education and Training Placement Information Program which graphically describes all the components and activities associated with the program.

Table 1

Florida Profile

Authorization/Rationale	Florida legislative directive enacting a placement requirement for public vocational education programs (job preparatory)
Cooperating Agencies	• Florida Department of Labor and Employment Security • Florida Department of Education
Specific Data Files Used	• UI wage record data • Databases of U.S. Department of Defense, U.S. Office of Personnel Management, U.S. Postal Service, State university system, community colleges, public schools (adult education), and state corrections
Vocational Education Target Group/Size	Annual summary of vocational education graduates/1988-1989 graduates n=196,665 which includes all secondary and postsecondary graduates in school and institutions
Demographic Data	Race, gender, handicapping condition, age, and socioeconomic data
Educational Data	Institutional base of program (e.g., secondary school district, community college), vocational program, completer/leaver/special student status
Employment Data	Occupational code, number of weeks worked, amount earned, county location, industry of employment, size of employer, employment in federal government (personnel, military, postal service), enrollment in university or community college
Analyses Conducted	Publishes earnings based on full-time, full-quarter employees. Also reports the percentage of people who were full-time, full-quarter employees from specific programs
Major Findings	64% of graduates were employed in Florida businesses, 2% were federal employees or in the military, 20% were continuing their education
Future Directions	Maintain the program, investigate using neighboring states' wage record systems, and explore new ways of identifying "no find" students
Format of Report	• Published annual reports • Catalog of standard reports • Targeted studies

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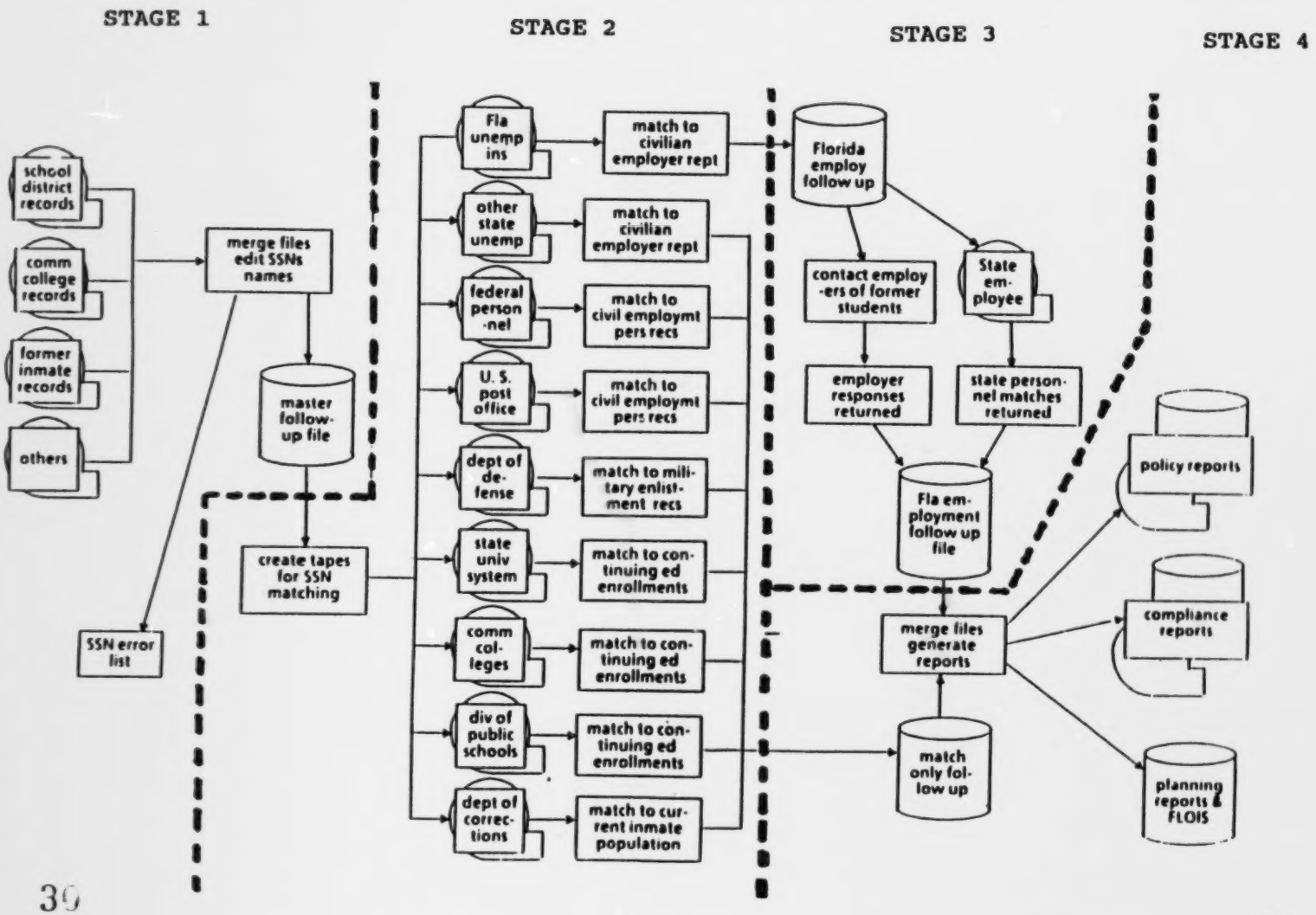

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Washington

Washington has expansive student records at the postsecondary level. It matches these records with its UI wage records together with those from Alaska, California, Idaho, and Oregon. Matches are made before, during, and after enrollment identified those who are upgrading skills rather than initial preparation skills. State staff holds the position that confidence is higher for conclusions drawn for small subgroups: groups that typically do not respond to mail surveys. Washington has also done considerable work with an "employment related to education" indicator.

In 1990, the Washington State Board for Community College Education (WSBCCE) (since renamed the Washington State Board for Community and Technical Colleges) tested the effectiveness of using other agencies' administrative data files to provide information on employment and educational outcomes of vocational education completers as an alternative to the traditional follow-up survey process. For reasons of economy and accuracy, the WSBCCE sought to substitute for its traditional mail or telephone follow-up survey of its former students a new technique to gather employment outcomes. The other agencies and the files included the Department of Employment Security (DES) (unemployment insurance and benefits systems) and the Office of Financial Management (OFM) (records of students enrolled at four-year public and private institutions). Since completion of the pilot study, WSBCCE has added the Department of Defense file as well as the UI files from the states of Alaska, California, Idaho, and Oregon. Agreements were entered into with both the DES and the OFM to facilitate the process of matching vocational education completers with those identified in the DES and OFM files.

The social security numbers of 14,096 postsecondary vocational program and course completers of the school year 1987-1988 were matched against both the UI wage-record and the UI benefit history during the first quarter of 1989. Most of the completers were about nine months out of the programs.

Information included within the student record for each completer are the following:

1. Community College Attended

2. Ethnic Origin, Sex, and Age

3. Classification of Instructional Program Code (CIP)

4. Handicap Status

5. Limited-English Proficiency (LEP) Indicator

6. Academic and/or Economic Disadvantaged Indicator

7. Zip Code of Student's Current Address

8. Institutional Intent Category Indicator (tells if the student took exclusively vocational courses, or vocational-with-academic, or basic skills/developmental courses)

9. Enrollment History

10. Exit Status (type of completer)

Information provided by the DES to WSBCCE on each matched individual included

1. Workforce Status (e.g., employed, unemployed)

2. Standard Industrial Code (SIC)

3. Employment Location

4. Employment Related to Education Indicator (SIC of firm matches or does not match CIP code of completer's major)

5. Estimated Annual Salary

6. Quarterly Hours

7. Business Size (One of ten categories based on number of employees)

8. Upgrading Retraining Indicator (Completer in one of three categories: [1] worked for same firm before, during, and after training; [2] worked for same industry [SIC code] before, during, and after training; or [3] started college before ES files were available)

A total of 9,387 matches were identified, or about sixty-seven percent of the original population of 14,096 postsecondary vocational education completers.

Issues of concern identified by the Vocational Outcomes Research Review Group charged for the conduct of the pilot study included

- Multiple employers of individual completers (16% of the completers had two or more employers during the match quarter so that the employment could be simultaneous or sequential)
- SIC/CIP update regularity
- Inclusion of all employees in ES files (exclusions, out-of-state workers)
- Relationship of jobs to training
- Definition of unemployment (insured versus uninsured)
- Job upgrading and retraining

When comparing the pilot test results to the more traditional mail and telephone surveys, the overall strengths and weaknesses of the DES matches were as follows:

Strengths

- The DES match process provides slightly more information at considerably less cost and probably with less nonresponse bias.
- Confidence may be higher in conclusions drawn for small subgroups since subgroups such as minorities tend to respond to a lesser extent to traditional surveys.
- The jobs-related training information at the summary level is more reliable for future decision making since the ES match is probably a less biased source than a survey and provides information on more completers.
- Because old survey processes usually limited a study to program completers because of the high costs, the pilot test allowed for more course completers to be included.

- The match of employment before, during, and after enrollment allows for identifying completers who are really upgrading job skills rather than preparing for a new job.

Weaknesses

- It is estimated that about twenty-five percent of employed completers were not matched. The WSBCCE plans to compensate for this by conducting a traditional mail and telephone survey of the nonmatching completers every five years.

- The SIC to CIP relies on a protocol matching the SIC and CIP codes which has the potential for inaccuracies. This is because the protocol matches only the industry and not the occupation to the CIP code. For example, a graduate of a mid-management program employed as a secretary would probably show up as in a job related to training.

- Since the "insured unemployment rate" is not the same as the more commonly used unemployment rate, some misunderstanding can occur.

Finally, the Vocational Outcome Research Review Group (see Appendix D) reached the following conclusion:

> The pilot study showed that SBCCE could use administrative databases to provide some of the information needed for outcomes assessment of the community college system. While the information is not as complete as might be desired, the coverage compares favorably with the much more costly survey process. The information available by data match also includes details which have not been provided in previous surveys such as a proxy measure for job upgrading and information on industry and firm size. (p. B-9)

Table 2

Washington Profile

Authorization/Rationale	The Washington State Board for Community College Education sought to conduct a pilot study of the feasibility of using employment security and higher education files to track the employment and education outcomes of vocational education program completers.
Cooperating Agencies	Department of Employment Security, Office of Financial Management
Specific Data Files Used	• UI wage records (Washington, Alaska, California, Idaho, and Oregon) • Higher education student records
Vocational Education Target Group/Size	Postsecondary vocational education program completers for 1987-1988/n=14,096
Demographic Data	Age, gender, ethnicity, disability, LEP/disadvantaged indicator
Educational Data	Instructional program by CIP code, quarter/year started, quarter/year last enrolled, exit status, and other data
Employment Data	For the first quarter of 1989—the workforce status (employed or unemployed), SIC code, employment location, estimated annual earnings, business size, hours worked during quarter, upgrade/retraining indicator, and employment related to education indicator (SIC/CIP match)
Analyses Conducted	• Training related to industry code (SIC/CIP). • Upgrade/retraining indicator (whether employee worked prior to, during, and following training in the same firm and/or industry)
Major Findings	67% of completers were matched with the UI wage record database. 16% of the completers had two or more employers during the analysis quarter. The UI wage record match process provides slightly more information than traditional follow-up studies at considerably less cost and with significantly less nonresponse bias.
Format of Report	Operations report available from the Washington State Board for Community and Technical Colleges, October 1990
Future Directions	Outcomes data is being reported annually in eighteen occupational program clusters at the state and institutional levels. Five-year averages are developed annually for employment, earnings, and other outcome variables.

Alaska

Alaska state law requires employers to report job titles on the UI wage record. The Alaska Department of Labor actively markets its matching capability and uses UI matching for a variety of training programs including vocational education, Job Opportunities and Basic Skills (JOBS), and the state-funded State Training and Employment Program (STEP). Individual institutions/programs require UI wage record information from the state agency.

During the last several years, the Alaska Department of Labor has collected occupation and place-of-work information for most of Alaska's wage and salary employees. This unique data source called the Occupational Data Base (ODB) originated as a means of identifying the economic impact of nonresident workers. While the issue of residency is no longer the prime concern, Alaska continues to collect this data in addition to the federally required information in the UI wage record database.

Alaska currently crossmatches the ODB which includes a four-digit occupational code and geographic location of employment and wage records with unemployment insurance data, Alaska Permanent Fund Dividend data, and other related information. In addition, it is possible to obtain information from other Pacific Northwest states about the industry and earnings of Alaska graduates that have left the state. However, studies of interstate mobility of vocational education graduates have not been attempted.

Over the past few years, human resource development programs have begun to tap this database for employment and earnings status studies of their graduates, and the Department of Labor is actively marketing their potential to various training entities. The Alaska Vocational Technical Center requested the Alaska Department of Labor's analysis of its 1988 graduates' earnings performance before and after training. Based upon its study "Employment Status and Earnings of Alaska Vocational Technical Center Training Program Graduates Completing Training in Fiscal Year 1988," the Alaska Department of Labor (1990, see Appendix D) was able to conclude that "without exception, when comparing earnings by course, training had a significant positive impact on graduates total and average earnings" (p. 2).

One year later, the Department of Labor analyzed the earnings performance of AVTECH 1989 graduates before and after training. Among its findings,

- Nearly half (48%) of the 204 graduates working in wage and salary employment in Alaska the year following training were employed in industries and/or occupations which were related to their course of study.

- Total earnings for all graduates were up 115% from the year before training began.

Another study looked at program completers from the Martin Luther King Career Center, a secondary vocational-technical school in Anchorage, Alaska. The 259 students in the King Career Center study completed three or more credits in an occupational cluster in 1987. Major findings included the following:

- Overall, twenty-five percent of the completers working in wage and salary employment in Alaska in 1990 were employed in industries and/or occupations related to their course of study.

- Average 1990 earnings of the completers exceeded those of other Alaska workers their age, both overall and by gender.

Cooperative agreements have also been reached with other Alaska state agencies to use Department of Labor data sources to help evaluate the JOBS and STEP programs. STEP is an Alaska program funded by employee contributions to the Unemployment Insurance Trust Fund.

Table 3

Alaska Profile

Authorization/Rationale	In 1987, the Alaska Department of Labor supplemented the UI wage record data with the Occupational Data Base to assess the economic impact of nonresident workers.
State Agencies	Alaska Department of Labor
Specific Data Files Used	• UI wage record data • ODB (includes 4-digit occupational code and geographic area of employment)
Vocational Education Target Group/Size	Two studies have been done for local vocational schools—one secondary using 259 completers from 1987 and one postsecondary with 204 graduates from 1989
Demographic Data	Age, ethnicity, gender
Educational Data	Occupational education course title or cluster, dates of training, geographic region of training
Employment Data	Occupational code (4-digit), industry of firm, quarterly wages, average earnings (one and three years), location of employment
Analyses Conducted	Reports are done for individual schools and institutes—comparisons of earnings of secondary vocational education concentrators with overall age group cohorts and pre- and postprogram earnings comparisons for postsecondary vocational-technical education completers.
Major Findings	• In the secondary school study, 25% of completers were working in occupations related to training and their earnings exceeded the earnings of their age cohorts who did not receive vocational education. • In the technical institute study, 48% of the completers were employed in training-related occupations and their postprogram earnings were 115% of preprogram earnings.
Format of Report	Individual reports are prepared for schools and technical institutes and are available from the Alaska Department of Labor.
Future Directions	Cooperative agreements have been reached with other state agencies to use the UI and ODB data to evaluate JOBS and STEP (state-funded).

Colorado

Colorado law requires accountability of its postsecondary institutions by reporting "evidence of after-graduation performance." Subsequent UI wage records matching data is shared with the postsecondary institutions for their use in program review and accountability.

Amid the growing demands for educational accountability nationwide, the Colorado General Assembly in 1985 passed House Bill No. 1187 which among other things required the following:

> That institutions of higher education be held accountable for demonstrable improvements in student knowledge, capacities, and skills between entrance and graduation; . . . and that institutions of higher education shall design and implement a systematic program to assess the knowledge, capacities, and skills developed by students in academic and cocurricular programs. (Article 13, Section 23-13-101(1)(a), (3)(a))

In Colorado, one area of accountability reporting is "evidence of after-graduation performance" in such areas as employment and continuing education. Under the leadership of the Colorado Community College and Occupational Education System (CCCOES), the state began to explore ways to generate accountability data at the state level and pass it back down to individual community colleges. By combining data provided by Colorado public postsecondary institutions with data available from the Colorado Department of Labor and Employment, the CCCOES has developed a longitudinal database which monitors students' postgraduation employment and continuing education behavior in what the state considers a cost-efficient manner.

The longitudinal student tracking system contains data from the following three sources: (1) the Colorado Commission of Higher Education (CCHE), (2) the Colorado Department of Labor and Employment (CDLE), and (3) the CCCOES. In 1989, the CCHE upgraded its Student Unit Record Data System (SURDS) to include an undergraduate applicant file, a student Fall enrollment file, a degree granted file, and a financial aid file.

The CCCOES has been tracking after-graduation employment of its degree and certificate recipients through the UI wage files for a number of years. In general, the process proceeds as follows:

1. CCHE sends to the CCCOES a tape of recent graduate social security numbers.

2. CCCOES sends this tape to the Colorado Department of Local Affairs (CDLA).

3. CDLE send the UI wage record file to CDLA.

4. CDLA crosswalks the CCHE and CDLE files and sends CCCOES a copy of the matched file.

5. CCCOES compares this data and matches it with previous years' data and with other administrative databases such as CCHE's SURDS.

6. CCCOES analyzes the data and forwards reports to individual community colleges for use in program review and accountability reports.

The initial run was conducted on the 1985-1986 community college degree class because this was the first group for whom data was available from all three sources. Of the 3,797 degree and certificate recipients in 1985-1986, 19.6% were enrolled in additional education programs, and about 57.9% were found in the UI file approximately one year after graduation. Of these, 12.4% were both working and going to school. Approximately one-third of the graduates were not identified in either file. One year later, a few additional graduates were identified in the UI file as working in Colorado.

Colorado further identifies the crossmatched data based upon a number of variables such as college type attended, degree type received, gender, age, and ethnicity and can compare work status and an earnings profile across such variables.

Table 4

Colorado Profile

Authorization/Rationale	In response to new state mandates for increased educational accountability, the Colorado Community College and Occupational Education System developed a longitudinal database to monitor postgraduation employment and continuing education.
Cooperating Agencies	• Colorado Commission on Higher Education • Colorado Department of Labor and Employment • Colorado Department of Local Affairs
Specific Data Files Used	• UI wage records • Higher education enrollment
Vocational Education Target Group/Size	Initial study focused on 3,797 associate degree and certificate recipients from 1985-1986
Demographic Data	Gender, age, and ethnicity
Educational Data	Type of college attended, degree received, higher education status
Employment Data	Work status, earnings profile
Analyses Conducted	Data tables are developed by CCCOES and forwarded to each postsecondary institution for use in program review and accountability reports.
Major Findings	For the 1985-1986 graduating class: 19% were enrolled in higher education, 58% were in the UI wage record file (i.e., employed) one year after graduation, and 12% of those employed were both working and going to school.
Format of Report	Research report prepared by a state agency official for a regional conference.
Future Directions	Reports are provided to local community colleges upon request.

Feasibility or Exploratory Work Completed/Planning Underway for Systemic Use

Both *Indiana* and *Illinois* have studied using UI wage record information for follow-up purposes and both have decided to move forward—Indiana based upon its successful pilot study and Illinois based upon its successful JTPA utilization of the UI wage record data.

Indiana

The Indiana Commission on Vocational and Technical Education has identified a need for more accurate and timely data and information for planning, evaluation, and decision making. Indiana has conducted pilot testing with UI wage records and is ready to proceed. A reorganization in state government has occurred which combines vocational education, workplace literacy, employment and training, UI, and JTPA into one department which should improve working relationships and communications.

Since early in its existence, the Indiana Commission on Vocational and Technical Education (ICVTE) has acknowledged a greater need for accurate and timely information for planning, evaluation, and decision making. As in most states, the vocational education establishment in Indiana conducts an extensive follow-up of vocational program completers and leavers, utilizing traditional mail follow-up techniques. In 1989, the ICVTE began discussions of the use of social security numbers for matches with such databases as Unemployment Insurance, the Department of Defense for military personnel, and the Indiana Commission for Higher Education for those students enrolled in postsecondary education. It also required that as of the Fall of 1989, social security numbers were required as part of the enrollment process.

During the Spring of 1990, the ICVTE completed a pilot project on fifteen-hundred student completers from the school year 1988-1989 using the three databases described above. Over seventy-one percent of the fifteen-hundred student completers were matched in one of three files with 66.5% employed, 3.4% in the military, and 16.7% enrolled in some form of postsecondary education. This seventy-one percent figure compares with the twenty-eight to twenty-nine percent which the state of Indiana previously found through its traditional mail follow-up. Plans are underway to examine all high school and adult completers from 1989-1990 in the near future. It is anticipated that soon all postsecondary

completers will be included in the system. Indiana closely follows the system developed in Florida (described earlier in this report) and currently crossmatches student files with those of UI, the Department of Defense, and the Indiana Commission for Higher Education.

Lastly, it should be pointed out that a reorganization in state government has recently taken place, resulting in the establishment of a Department of Workforce Development which includes individuals formerly working in vocational education, workplace literacy, employment and training, UI, and JTPA programs. This reorganization should go a long way toward improving working relationships among all those involved.

Table 5

Indiana Profile

Authorization/Rationale	The Indiana Commission on Vocational and Technical Education has sought accurate and timely information for planning, evaluation, and decision making. It has and continues to conduct pilot studies.
Cooperating Agencies	• ICVTE • U.S. Department of Defense • Indiana Department of Employment and Training Services/Unemployment Insurance (UI) • Indiana Commission for Higher Education
Specific Data Files Used	Social security numbers matched for completers from five secondary vocational-technical education districts with active military personnel, enrollment in public postsecondary institutions, and UI wage records.
Vocational Education Target Group/Size	1988-1989 completers from five secondary vocational education programs/n=1,497
Demographic Data	None
Educational Data	Occupational program title
Employment Data	Employment (3rd and 4th quarter of 1989), military enlistment (as of September 1989), and enrollment in higher education (in 1989-1990)
Analyses Conducted	Sample aggregate reports were prepared for each of the five area secondary programs. For each of the matched employees, the ICVTE contacted employers for occupational titles and the county of employment.
Major Findings	Overall, 71% of the completers in the initial pilot were found in one of the three databases. Specifically, 66% were found in the wage records, 16% were in higher education, and 3% were in the military.
Format of Report	Memoranda prepared by staff members for ICVTE.
Future Directions	The recent establishment of the Indiana Department of Workforce Development will most likely call for more interagency evaluation and accountability initiatives such as this.

Illinois

The Illinois Department of Employment Security (IDES) has established an Employment Tracking System (ETS), a longitudinal database of seven years of information on wages, UI, and job service contacts, in order to provide various agencies access to the information. The department has also developed formal shared data agreements to facilitate that access. Illinois will use UI wage record information to comply, in part, with the requirements of performance standards under the Perkins Act.

The Illinois State Board of Education will be using the IDES-established ETS in monitoring its Perkins vocational education performance standards in 1992. ETS will be used to collect employment and earnings information on students served in vocational education at the secondary and postsecondary levels.

The goal of the ETS is to provide various agencies, including the Board of Higher Education, the Community College Board, the Department of Aging, and the Department of Children and Family Services, access to information which evaluates the impact of their education or training programs on the persons they have trained. The JTPA system in Illinois has used the ETS measures in its performance system. Individual client information is available, however, only if the person continues to live and/or work in Illinois.

An agency authorized to participate in ETS submits a tape containing the social security numbers (SSNs) of persons they wish to track to IDES. The SSNs are then entered into ETS and a tape containing the historical wage data is returned to the agency. Agencies seeking to utilize the information base of ETS enter into a formal Shared Data Agreement which, among other things, promises to maintain strict confidentiality of any data that is provided as well as describing costs to be reimbursed to IDES by the participating agencies. All development costs and all costs for the first year of operation were absorbed by IDES. A fee is charged per SSN tracked.

A significant concern to Illinois are the metro labor markets it shares with Missouri, Iowa, and Indiana. Illinois is attempting to develop data exchange agreements with these states as well as to conduct matches of JTPA clients with their wage files. In addition, factors such as demographics, JTPA program intervention, and local economic conditions are to be addressed by use of multiple-regression statistical modeling.

In 1989, the Illinois Education and Employment Subcabinet began work on a Master Plan for Employment and Training. The Master Plan identified and reviewed current workforce preparation programs and proposed strategies for improved coordination. For the first time, the plan required a combined evaluation of state programs using ETS, which was developed by IDES. In 1990, the Education and Employment Subcabinet organized an Interagency Task Force led by the IDES to conduct a pilot study in using the ETS system to conduct a combined evaluation of state employment and training programs. The study was designed to develop a comprehensive set of performance measures and explore the problems and limitations in conducting combined program evaluation with the ETS system across nine state agencies. Although the final report of the pilot study has not yet been released, some preliminary observations have been offered. Program performance was to be evaluated in following three major areas:

1. *Employment Measures.* The employment measures utilized are employment rates representing the percentage of the former program participants who were employed in UI-covered employment during a given postprogram quarter.

2. *Employment Retention Measures.* The measures assess the degree to which participants remain employed over a specified period of time.

3. *Earnings Measures.* The earnings measures attempt to assess the quality of employment, first by simply measuring the average earnings of participants during the first postprogram quarter of employment and then by extending that measurement over a given period of time.

The tentative plans for the Vocational Education System of Performance Measures and Standards call for using ETS to assess the state goal which focuses on enabling students to "obtain employment which provides for economic self-sufficiency and career advancement." ETS measures for this goal will include employment rate, employment retention rate, average quarterly earnings, and training-related placement rate. To determine "training-related placement," ETS will have to be modified to include the collection of occupational data. Statewide standards for each measure are to be established in 1992-1993. The ETS employment data and analyses will be disaggregated to examine labor market and employment outcomes for special groups of former vocational education students (e.g., individuals who are disabled and others).

Table 6

Illinois Profile

Authorization/Rationale	In 1989, the Illinois Department of Employment Security established a longitudinal employment tracking system (ETS), which contains wage information, unemployment data, and Job Service contact information. In 1990, the Governor's Educational and Employment Subcabinet authorized a pilot study to conduct a combined evaluation of the state's various employment and training programs, including those overseen by the State Board of Education and the Community College Board. The ETS will be used in the Perkins System of Performance Measures and Standards for vocational education.
Cooperating Agencies	• IDES • ICCB • Nine other state agencies
Specific Data Files Used	• ETS data files on unemployment and wages for 1989-1990 • Social security numbers of completers
Vocational Education Target Group/Size	Occupational program completers in community college programs for 1988-1989/n=15,485
Demographic Data	None
Educational Data	Completion of an occupational education program
Employment Data	• Employment during four quarters following graduation • Retention in employment for consecutive quarters • Quarterly earnings
Analyses Conducted	• Percent employed in quarters 1-4 following graduation • Percent remaining employed for two, three, or four quarters • Average earnings for those graduates employed each quarter
Major Findings	70% of the graduates were employed; retention in employment in subsequent quarters declined from 91% (Qtr. 2) to 82% (Qtr. 4); average quarterly earnings increased from $4207 to $4621 during the first two quarters following graduation.
Format of Report	Technical Report of ETS multi-agency pilot study
Future Directions	ISBE will be using the ETS database to monitor employment and earnings of vocational education graduates as part of the Vocational Education System of Performance Measures and Standards. Consideration is being given to requesting the inclusion of occupational title in the database.

Feasibility or Exploratory Work Completed/ Future Development Or Use Uncertain

A number of states completed single analyses or studies in utilizing the UI wage record, but for a variety of reasons, have not proceeded to develop their implementation processes more fully. *Arizona* completed a pilot study to provide consumers data on placement rates, but has run into problems over confidentiality of social security numbers. *Missouri* conducted a longitudinal follow-up of its high school graduates and used UI wage record data to corroborate the self-reported data from its graduates. *New Hampshire's* Department of Economic Security studied the employment and educational experiences of students while in high school. *Oklahoma* performed a feasibility study matching student records to wage reports and hopes to conduct additional, in-depth studies in the future. *Texas* has performed a number of studies and looks forward to securing additional resources to more fully develop its system. *Virginia* conducted a pilot study based upon community college instructional program areas. Finally, *Wisconsin* conducted a research study utilizing both UI wage record information and income tax information and compared postsecondary completers and their earnings to a comparison group established by U.S. Census Bureau data.

Arizona

Arizona attempted to use UI wage records to "provide consumers of postsecondary vocational education" with placement rates and earnings of community colleges and selected private schools and met with limited success. It was unique in including some proprietary schools.

In 1985, the Arizona Legislature required the state to "publish and distribute a report of the placement rates and average salaries earned by persons completing vocational programs in this state." Subsequently, the Center for Vocational Education at Northern Arizona University undertook the responsibility of planning the report, collecting the data, and publishing an initial report in 1986.

As stated in its first report, the Center's purpose is to "provide consumers of post-secondary vocational education programs data regarding placement rates and earnings reported by employers to the Department of Economic Security associated with programs found in community colleges and private schools."

Social security numbers of program completers of public and private postsecondary schools were compared with the unemployment compensation files of employees reported by all employers in Arizona. In its first year, one-hundred percent of the public institutions but only forty-two private schools out of 107 (38%) private schools licensed by the state were included in the study. Those not participating either had less than twenty-five program completers or did not collect social security numbers for the completers.

The following caveats were offered in the study:

- Since each individual school participating in the study defined on its own a "vocational program," this lack of uniform program definition *prohibits meaningful comparisons of program graduates among schools* as the programs were of varying lengths and focused on a wide range of occupations.
- A number of private schools did not collect social security numbers of students.
- The database of the Department of Economic Security includes part-time and short-term employment as well as those employed full-time all year. There are also a number of workers excluded from the database.
- A number of program completers left Arizona for employment, entered the military service, or did not enter the labor market and are not included in the study.

Since the completion of the pilot study referred to above, the State of Arizona has run into some problems over the confidentiality of social security numbers. Persons advocating the use of social security numbers as student identification and hence available for use in such research projects have not yet persuaded the Arizona Legislature to pass enabling legislation.

Table 7

Arizona Profile

Authorization	The Arizona Legislature required state officials to publish and distribute a report of placement rates and average salaries earned by postsecondary vocational education completers.
Cooperating Agencies	Arizona Department of Employment Security Contracted to the Center for Vocational Education, Northern Arizona University
Specific Data Files Used	• UI wage record data • Social security numbers of students in public and private postsecondary institutions
Vocational Education Target Group/Size	All fifteen community colleges, two skill centers, and forty-two private schools providing postsecondary vocational-technical education provided social security numbers for completers during 1983-1984
Demographic Data	None
Educational Data	Institution, vocational-technical education program (independently defined), number of completers per program
Employment Data	1984-1985 earnings
Analyses Conducted	For each program within an institution—number of completers in Arizona, number and percentage with earnings, average earnings, and median earnings
Major Findings	The lack of uniform definitions for postsecondary vocational education programs in this study limits the utility of the findings. Several private schools do not collect social security numbers.
Format of Report	Published report for 1986
Future Directions	Additional consumer-oriented studies have not been undertaken. Substantial concern exists regarding the use of social security numbers for the evaluation of programs. Currently there are no plans to continue additional development.

Missouri

As part of a longitudinal, five-year study of secondary school students, Missouri compared vocational education completers with nonvocational education completers and used the UI wage data to corroborate the self-reported information provided by the completers.

The Missouri Department of Elementary and Secondary Education in cooperation with the Missouri Testing and Evaluation Service, University of Missouri at Columbia, undertook a longitudinal study of a sample of Missouri graduates from the class of 1981 which was extended over a five-year period. The overall purpose of the study was to determine the successes or difficulties high school graduates faced in the transition from high school to immediate post-high school years.

Thirteen area schools providing secondary vocational-technical programs participated. A random sampling procedure was employed to produce roughly equivalent samples, one consisting of vocational graduates and a second consisting of nonvocational graduates. State definitions were utilized to differentiate the two. The study was designed to compare and contrast the samples of vocational education and nonvocational education students, focusing primarily on economic aspects relative to salary and employment.

In the initial phase of the study, traditional follow-up techniques were utilized. Within the design of the study, former graduates were classified into vocational education completers and nonvocational education completers. During the five-year study, former students were provided personalized letters, and personal, subjective comments on the post-school experiences of students were actively solicited. Lastly, employment data and unemployment claims information from the Missouri Department of Employment Security (DES) were utilized to corroborate the self-reported data provided by the graduates.

In this latter phase of the study, wage record data was used. From the study's original sample of 1,514 students, 1,400 social security numbers were matched. Of these, 705 were from the sample of vocational education graduates and 695 were from the nonvocational students. These social security numbers of both groups were matched with data provided by DES which included

- applications for services provided by DES,

- Unemployment Insurance claims information,
- selected quarterly wages, and
- number of quarters worked since graduation.

Among the conclusions drawn for the report based upon the analysis of DES data are the following:

- More vocational than nonvocational graduates applied for services provided by DES (e.g., counseling, job referrals, and employment testing) from the 1981 through 1986.
- From the second quarter of 1981 through the second quarter of 1986, fifty-nine percent of the vocational graduates and sixty-five percent of the nonvocational graduates were actually paid unemployment compensation.
- The vocational education graduates showed consistently higher average fourth quarter wages from 1981 through 1985 than the nonvocational graduates in all three of the categories—full-time work, part-time work, and other/unknown status (e.g., military, wage record data, but no returned questionnaire).
- The number of quarters worked from the second quarter of 1981 through the first quarter of 1986 indicated that vocational education graduates were working a median of thirteen quarters, while nonvocational graduates worked a median of eleven quarters.

Table 8

Missouri Profile

Authorization/Rationale	UI wage records were used in a five-year longitudinal study of 1981 high school graduates sponsored by the Vocational and Adult Education Section of the Missouri Department of Elementary and Secondary Education.
Cooperating Agencies	• University of Missouri at Columbia • Missouri Department of Employment Security
Specific Data Files Used	• DES administrative files (UI wage records) • Social security numbers of 1981 graduates
Vocational Education Target Group/Size	1981 graduates of secondary vocational-technical education centers/n=705
Demographic Data	None reported
Educational Data	Completion of a secondary vocational-technical education program
Employment Data	• Services received from DES • UI insurance claims information • Wages for selected quarters • Number of quarters worked since graduation
Analyses Conducted	Comparisons of employment data for graduates of vocational education programs and graduates of nonvocational education programs.
Major Findings	Graduates of vocational education programs showed consistently higher average fourth quarter earnings from 1981-1985 compared to nonvocational graduates. Vocational education graduates were employed more consistently than nonvocational education graduates.
Format of Report	Two research reports are available, including a summary report on the longitudinal study and a special report on the analysis of the DES data.
Future Directions	None indicated in the reports.

New Hampshire

New Hampshire investigated the labor market activities and experiences of high school aged youth and looked at five different cohorts who were tracked and compared over a four-year period.

Although not specifically directed toward utilizing wage record data in the assessment of vocational education graduates or completers, the state of New Hampshire has recently completed an interesting study focusing an analysis of teenage labor market behavior and the levels of educational attainment. In the latter 1980s, New Hampshire experienced relatively good economic prosperity and a resultant tight labor market. This caused salaries to increase and attract high school aged youth—who might not otherwise—to work to a greater degree. Problems arose with a somewhat rising rate of dropouts. A legislative committee attempted to study the problem, but both educational and employment data were inadequate. The Commissioner of the Department of Employment Security decided to investigate the labor market activities of these high school aged youth. "Working & Schooling Decisions: A Study of New Hampshire Teenage Labor Market Behavior and the Level of Education Attainment" (see Appendix D) attempts to answer the following questions among others:

> What types of jobs are noncollege-bound youth qualified for after leaving high school? How well do high schools prepare noncollege-bound youth for the workplace?
>
> What industries hire in-school teenagers and to what extent do these industrial categories change once students leave school?
>
> What is the relationship between educational outcome measures and productivity on the job? Do improvements in the former translate into improvements in the latter?
>
> What institutional arrangements currently exist to aid youth in the school-to-work transition process and what changes need to be made to smooth transition paths? (p. 1)

Eighth- through twelfth-grade cohorts were established and data was tracked by sex, region of the state, and program type (i.e., academic, vocational, or general tracks). A total of 1,220 parental/guardian consent forms were obtained for students to participate in the study. Of these, 1,140 matches were found in the New Hampshire Unemployment Insurance Quarterly Employment and Wage Records or about 93.5% of those consenting to be involved in the study.

The New Hampshire study provides new strategies for the utilization of wage record data for tracking students still enrolled in school and their experiences in the labor market. This has implications for how vocational educators, particularly on the postsecondary and adult levels, may wish to use wage record data in a follow-up situation. Data may be collected from years prior to enrollment, during enrollment, and then a number of years following course or program completion to construct an accurate earnings or work profile of vocational education completers.

The following three recommendations emanating from the New Hampshire report merit consideration:

1. Open new and expand old lines of communication between high schools and employers to foster the school-to-work connection.

2. The opportunities and alternatives available to noncollege-bound youth should be expanded.

3. The State Departments of Employment Security, Education, and Postsecondary Technical Education, working in conjunction with the State Occupational Information Coordinating Committee (SOICC), the University System of New Hampshire, and the New Hampshire Job Training Council should design a database integrating the employment, training, and educational histories of New Hampshire youth. This comprehensive integrated database would allow further tracking of youth beyond high school, thereby providing additional information on the school-to-work transition process. It can also serve as a valuable assessment tool. At the heart of this database would be the Unemployment Insurance Wage Credit Records.

Table 9

New Hampshire Profile

Authorization/Rationale	Beginning in 1987, the New Hampshire Department of Employment Security launched the New Hampshire Teenage Labor Market Study to examine the employment and education experiences of youth during their high school years.
Cooperating Agencies	New Hampshire DES
Specific Data Files Used	• UI wage record data • High school transcripts
Vocational Education Target Group/Size	Five grade-level cohorts (grades 8-12) were followed from four years (1987-1990)/n=1,220. This was a statewide representative sample of the population of students in grades 8-12. Of the students in the sample, 107 were in the vocational education track.
Demographic Data	• Gender • Region of high school in the state (3 regions)
Educational Data	Transcripts provided by high schools indicated the track of each student included in the sample (vocational, general, academic, and unknown).
Employment Data	For 1,140 usable wage record files—employment by quarter (1987-1990), quarterly hours worked, annual and quarterly earnings, and standard industry classification (two-digit).
Analyses Conducted	The employment data was analyzed for each of the five cohorts over the four-year period with attention to the high school program tracks.
Major Findings	99% of the 1989 seniors were formally employed at some time during 1987-1990; 71% worked in at least three quarters. Students in a vocational or general education program worked significantly more hours per week than academic track students, primarily in retail trade industries. The 1990 economic downturn in New Hampshire has had a profound effect on youth employment which may affect future employment and income stability.
Format of Report	Series of three research reports published by the New Hampshire DES (see Yasuda, 1991 [see Appendix D]).
Future Directions	A major recommendation in the report suggests that several state departments (education, postsecondary, technical education, and employment security), the university and the SOICC design and use a database integrating the employment and education histories of New Hampshire youth, using UI wage records as the core.

Oklahoma

The Oklahoma Department of Education conducted a feasibility study that showed matching student records with wage records to be an effective method for assessing placement of vocational education completers. Oklahoma also included a sizable number of adult vocational education completers in the study.

The Oklahoma Department of Education undertook a study in 1989 to determine the feasibility of matching student records to employer wage reports to assess vocational completer labor market outcomes. The only aspect of labor market outcomes to be investigated was job placement since the primary purpose of the study was to examine the methodology.

The department provided student completer data consisting of 14,907 records (social security numbers and CIP code) from the 1986-1987 school year to the Oklahoma Employment Security Commission (ESC) for matching. Of these completers, 73.1% were secondary vocational education completers while the balance were adult completers. For purposes of this study, if an individual was working in one, part, or in all four quarters of 1988, they were counted as a match.

Of the 14,907 completers submitted to the ESC, 10,340 (69.4%) wage record matches were obtained for 1988. Secondary completers had a match rate of 69.1% while adult completers were matched at 70.1% Analyses were also performed to ascertain the relationship between the CIP and the standard industrial classification (SIC) of the completers' employers.

Some summary statistics from the report are of interest:

- The percentage of secondary completers working in any given quarter varied as much as 11% across four quarters of 1988. The percentage of adult completers working each quarter was greater than 80% and remained stable between quarters.

- The percentage of secondary completers who worked each quarter but in a different industry was 47.2%. Sixty-three percent of adult completers worked in at least two different industries during 1988.

- The number of adult completers who worked in the same industry throughout 1988 was nearly double (40.5%) that of secondary completers who did so (22.6%).

- There were ten standard industrial classifications (SIC)s in which 100 or more completers were working at some time in 1988. These ten SICs employed 42.2% of all vocational completers who worked in 1988.

But perhaps of more interest are some of the conclusions about the methodology of using wage record data that the Oklahoma study put forth:

- Matching student records against employer wage records has been shown to be an effective method for assessing industry placement of vocational completers.

- Further in-depth analyses is needed to examine some of the limitations inherent in the methodology such as the possibility of collecting occupational titles, at least at the time of initial employment.

- Other databases need to be looked at, at both the state and federal levels, to identify the approximately 30% of completers not found in the wage record files.

- In most cases, the majority of vocational completers in a given occupational field are not concentrated in selected SICs but are finding employment in as many as 259 SICs. However, thirty-six SICs employed 64.9% of the 1986-1987 completers. Some interpretations advanced for this phenomenon include (1) broad staffing patterns in any given SIC (in the oil and gas service industries, completers could be employed as auto service technicians, accountants, and secretaries) and (2) broad training in any given occupational program (graduates of accounting programs could be using their skills in several industries, e.g., department stores, auto dealerships).

- Placement is a single dimension of labor market outcomes, which in themselves are a single indicator of vocational education effectiveness. When assessing the effectiveness of vocational education, it is extremely important to consider (1) multiple outcome measures and (2) year-to-year improvement measures.

Although this was a one-time study for the Department of Vocational and Technical Education, it is their hope to conduct additional and more in-depth studies using this

methodology as soon as new working relationships can be established with the Oklahoma Employment Security Commission.

Table 10

Oklahoma Profile

Authorization/Rationale	The Oklahoma Department of Vocational and Technical Education sought to examine the feasibility of matching student records to employer wage records to assess vocational completer labor market outcomes.
Cooperating Agencies	• Oklahoma Department of Vocational and Technical Education • Oklahoma Employment Security Commission
Specific Data Files Used	• 1986-1987 state generated vocational completer list • 1988 hourly and wage records of the Oklahoma Employment Security Commission
Vocational Education Target Group/Size	1986-1987 vocational education completers/ n=14,907: secondary, 10,888 or 73.1%; and adult, 4,019 or 26.9%
Demographic Data	None
Educational Data	Vocational-technical education program (CIP code)
Employment Data	Employed during one or more quarters in 1988 and the SIC code
Analyses Conducted	Number of completers who worked in 1988, number of completers who worked in the same industry in each quarter, and employment of completers in specific SICs overall and by specific occupational division.
Major Findings	70% of the completers worked at some time in 1988. The percentage of adult completers who maintained stable employment and same-industry employment in 1988 was higher than for secondary completers. Ten SICs employed 42% of all completers.
Format of Report	Research report available from the Oklahoma Department of Vocational and Technical Education.
Future Directions	None indicated.

Texas

Texas conducted a feasibility study which concluded that the expected benefits of UI wage reporting for follow-up purposes would reduce collection costs, facilitate standardized collection, provide for integrated data analysis, and provide data to regional and local planning processes.

The State of Texas recently conducted a number of studies attempting to examine the feasibility of using UI wage records to demonstrate the outcome of public education and training programs. Across state government, the State Occupational Information Coordinating Committee (SOICC) under contract with Arthur Anderson and Company, studied the outcomes of state-funded education, training, and employment program participants. The study culminated in a definition of the statewide database of occupationally specific data within a proposed Quarterly Employment Tracking System (QETS). The pilot concluded that utilizing QETS was a viable approach to meeting accountability standards in Texas, but it also identified a need to enhance the current wage record reporting system so that such information as occupational and wage identifiers would be included. This would require legislative action and access to additional resources—resources that, as in most states, do not appear to be available at the present time. Currently, full implementation of QETS is on hold.

Potential benefits identified in the SOICC/Arthur Anderson and Company report if fully implemented follow:

- Reducing collection costs to the State of Texas by consolidating data collection/reporting functions through the use of existing databases and systems.
- Facilitating the standardized collection of follow-up data for education, training, and employment programs in Texas and, thus, improving the quality of the data.
- Providing an available source for integrated data analysis and follow-up for the Texas Human Resource Investment System.
- Reducing the amount of staff time and postage costs associated with locating former program participants and their respective employers to conduct follow-up surveys.
- Providing occupational placement and wage rate data to statewide regional and local planning processes.

More specific to the field of education generally and to vocational education in particular was a study undertaken by the Center for the Study of Human Resources at the LBJ School of Public Affairs, University of Texas at Austin, under contract with the North Harris County College District in 1989 to design, develop, and pilot a postprogram follow-up system for postsecondary vocational education students in Texas. Originally, the project was to rely on a mail or telephone survey of program year 1988 students from four community colleges in Texas. However, it was later decided to conduct a follow-up pilot study of completers and nonreturning students using administrative records, most notably UI records from the Texas Employment Commission (TEC) whose database spanned a fifteen-month period and included quarterly earnings and the employer's name, financial reporting location/address, and industry.

Of the 8,612 students included in the pilot study, approximately eighty-five percent were found in the UI wage record database at least once during the five quarters under review. While using conventional, self-reporting techniques, only 34.9% of the vocational education completers were identified, while, in sharp contrast, 73.8% of the completers were located in covered employment in the third quarter of 1988 using the UI wage record files.

Costs became a significant part of the study. All 8,612 student records were processed by the TEC at a cost of less than $86. Statistical analysis at TEC was approximately $2,500. More than 7,200 former students were found in the UI wage record file with a cost per student match of less than $0.36 and a cost of less than $0.08 for each wage record accessed. On the other hand, it was estimated that the conventional survey approach utilized by most postsecondary education institutions in Texas costs at least five to ten dollars per completed survey.

The study concluded that "by matching student records with UI wage records an informational void can be readily filled at a very low cost." It further states that information obtained from UI wage records can also be used for the following:

1. To demonstrate value-added competencies;

2. To determine the various career paths taken by students in specific programs;

3. To track student mobility; and

4. To assess the durability and applicability of skills in the current labor market through retention studies.

Finally, the study recommends that the Texas Higher Education Coordinating Board and two-year postsecondary institutions should consider adopting UI wage records as a permanent, follow-up data source as well as investigating the expansion of the sources of administrative records (i.e., adjoining state UI files, educational, military, and federal records).

Table 11

Texas Profile

Authorization/Rationale	Two major studies have been done in Texas to examine the feasibility of using UI wage records to demonstrate the outcomes of public education and training programs.
Cooperating Agencies	• Texas Occupation Information Coordinating Committee • Texas Higher Education Coordinating Board • Texas Employment Commission (TEC)
Specific Data Files Used	• UI wage records • Completing and nonreturning student records from four postsecondary education institutions
Vocational Education Target Group/Size	Completers and nonreturning postsecondary vocational-technical education students in 1988 program year from four institutions. Group size/n=8,162
Demographic Data	None specified
Educational Data	Program completion status (completer or nonreturning), instructional program completed/ started (CIP code)
Employment Data	Employment by industry (4-digit SIC code), median quarterly earning
Analyses Conducted	Comparisons of completers and nonreturning students on the following: percentage employed vs. unemployed, employed in the same or different industry over five quarters, and median earnings over five quarters
Major Findings	Approximately 85% of the former students were found in the UI wage record data during the five quarters. Nonreturning students appeared to be more likely to be employed while attending school, which may have adverse effects on their ability to complete the programs.
Format of Report	Research report on the pilot study, Center for the Study of Human Resources, University of Texas at Austin
Future Directions	Citing significant cost savings over conventional mail or telephone follow-up studies, the report recommends that the Texas Higher Education Coordinating Board work with the two-year institutions to adopt and expand the use of administrative records such as UI wage records and other data on a permanent basis.

Virginia

Virginia's Employment Commission studies postsecondary vocational graduates from 1975, 1980, and 1983 using the UI wage records. In the report, the graduates were clustered by various curricula.

In August of 1988, the Virginia Employment Commission (VEC) published "Tracking Education Completers" which describes the development of the computer tracking system intended to provide employment and wage information on graduates of the Virginia Community College System (VCCS). Similar methods were also used for vocational graduates and participants of JTPA, but no reports were written for these projects. The information collected facilitates the evaluation of graduates, classes, program effectiveness, and return on human capital.

The completer tracking system merges the VCCS student record file and the VEC unemployment insurance wage and tax files. The VCCS student record file contained approximately 22,200 student records from the 1975, 1980, and 1985 graduating classes and contained individual student data such as social security number, graduation year, sex, race, year of birth, curriculum, degree, credits, campus and college code. The VEC files include information on ninety to ninety-five percent of the state's wage and salary employment. The UI wage files include information in Standard Industrial Code (SIC) and wages.

The merged data file contained approximately fifteen-thousand students, representing sixty-eight percent of the education completers from the VCCS files. The report, "Tracking Education Completers," profiles the 1985 graduating class of which there were about 6,210 matched records. Demographics for the graduating class are presented by sex, race, and age. Graduates were then clustered by the following curricula: business technology, engineering and industrial technology, college transfer, health technology, public service technology, art and design technology, and agricultural and natural resources technology.

Further breakdowns were performed within each curriculum cluster again by sex, race, and age and then by average total wages along with its standard deviation. Finally, analysis was accomplished by aggregating the employment of graduates by two-digit SICs and distributing them by curriculum cluster.

The following are two of the conclusions drawn in the summary section of the report:

1. The majority of the matched graduates were female. The only exception by curriculum area was engineering and industrial technology.

2. Average total wages were highest for the engineering and industrial technology group. The public service technology group was ranked second. The remaining technology groups were as follows: health, business, college transfer, art and design, and agricultural and natural resources.

Table 12
Virginia Profile

Authorization/Rationale	Over the last three years, the Virginia Employment Commission has indicated to various state agencies the availability of the UI wage record data. Reports have been done for the high schools, community colleges, and JTPA programs.
Cooperating Agencies	• VEC • Virginia Community College System
Specific Data Files Used	• UI wage records • Social security numbers of community college graduates
Vocational Education Target Group/Size	1985 graduates of the Virginia community colleges/ n=6,210 matched records
Demographic Data	Gender, age, race
Educational Data	Instructional program, degree, credits, campus, college, and graduation year
Employment Data	Average annual wages (based on five quarters from Quarter 1 in 1986 to Quarter 1 in 1987)
Analyses Conducted	Earnings data was reported by the curriculum area of the graduates.
Major Findings	Engineering/industrial technology graduates had the highest earnings ($24,260) and agricultural graduates had the lowest ($16,071). Differences in salaries between male and female graduates were also reported.
Format of Report	Report published by VEC, August 1988.
Future Directions	Use of the UI wage records is being considered by the Perkins Committee of Practitioners.

Wisconsin

Wisconsin utilized both UI wage record data and state income tax data to track postsecondary vocational education completers and developed a statistical comparison group using U.S. census data against which to compare the completers. In addition to the usual educational and demographic data employed in other studies, the Wisconsin study differentiated among completers by length of program, by possession of an economic disadvantage, and by various regions within the state.

In the spring of 1988, the Wisconsin Board of Vocational, Technical, and Adult Education (VTAE) contracted with the Vocational Studies Center at the University of Wisconsin at Madison to conduct a follow-up study of the postsecondary system's graduates by utilizing state income tax information. A total of 15,959 VTAE graduates were identified for the school year 1982-1983. In addition to the social security number for each of these graduates, other information obtained for each person included gender, age, race, program instructional area, length of instruction, district in which the instruction was obtained, and whether the student received financial aid while attending school.

This information was matched against the Wisconsin Department of Revenue's files for tax returns filed in 1985. A total of 12,982 matches were obtained—81.3% of 1982-1983 VTAE graduates filed income tax returns in the state of Wisconsin in 1985 or approximately two to three years following graduation.

During the course of that investigation, it came to the researchers' attention that the state of Wisconsin began a Wage Reporting System, administered by the Department of Industry, Labor, and Human Relations (DILHR). This system became fully operational in the first quarter of 1988. The tape of 1982-1983 VTAE graduates was run against the first quarter of 1988 DILHR tape and 11,220 matches were found, indicating that approximately seventy percent of the 1982-1983 VTAE graduates earned income in the state of Wisconsin during the first three months of 1988—almost five years after graduation.

Numerous comparisons were made between and among different groups of graduates based on the variables mentioned earlier for both income reported in 1985 and 1988. Some of these comparisons follow:

- The longer the term of training, the higher the earnings of the vocational education graduate. The only clear exception to this rule was individuals completing short-term trade and industry programs who in many instances out-performed some two-year program completers.

- Graduates from technical programs (two years in length only) and trade and industry programs earned more than graduates from all other program areas.

- There was no discernible difference in earnings between graduates who received student financial aid while attending school versus those who did not. In other words, being economically disadvantaged while attending school had little effect on earnings in the workplace.

- Postsecondary vocational education graduates received unemployment compensation less often and to a lesser extent than the general population in Wisconsin. In the first quarter of 1988, no 1982-1983 graduate received any form of unemployment compensation.

The researchers utilized U.S. Bureau of the Census data to develop a contrast group against which the 1982-1983 VTAE graduates might be compared. Utilizing the document, "Money Income of Household, Families, and Persons in the United States: 1985," as a starting point, this data was adjusted to conform to the age and gender distribution of the 1982-1983 graduate population. This data was further adjusted for Wisconsin using the 1985 ratio of Wisconsin per capita. The adjustment factor for 1985 was 0.953783; in other words, Wisconsin workers on average earned a little over ninety-five percent of the national average. Where comparisons were made for the five geographical regions of Wisconsin included in the study, per capita income for the five regions was derived by computing a weighted average of individual county per capita incomes published in "Current Population Reports," Series P-26, No. 86-ENC-SC, U.S. Bureau of the Census. Again, numerous comparisons by program area and by length of instruction were made to the comparison group, some of which follow:

1. Overall, postsecondary vocational education graduates economically out-performed comparison groupings based on the same gender and age breakdown for persons with a high school diploma.

2. The longer the graduate is in the workforce, the more that graduate economically out-performs his or her peers.

3. For the most part, female graduates out-performed their peers more than males when looking at percentages, although actual dollar amount differences were greater for males in 1988.

4. Compared to national statistics for 1985, the 1982-1983 graduates tend to work in year-round, full-time jobs to a greater degree than their peers with high school diplomas.

Among the many observations and conclusions reached in the report is the following: "The design of the research proved to be appropriate and highly feasible for carrying out follow-up research on vocational-technical students. In addition to a follow-up of recent completers, the methodology can be used for longitudinal studies. The potential exists to follow-up completers of training programs throughout their work careers."

Table 13

Wisconsin Profile

Authorization/Rationale	Study commissioned by the Wisconsin Board of Vocational, Technical and Adult Education to the University of Wisconsin at Madison.
Cooperating Agencies	• Wisconsin Department of Industry, Labor, and Human Relations • Wisconsin Department of Revenue
Specific Data Files Used	• UI wage record files • State income tax data • WBVTAE student record files
Vocational Education Target Group/Size	1982-1983 graduates of Wisconsin's sixteen technical colleges/n=15,959
Demographic Data	Gender, age, and region of the state
Educational Data	Instructional program area, length of instruction, and disadvantagement
Employment Data	• 1985 Wisconsin income tax data • 1988 Fall quarter wage record data
Analyses Conducted	Earnings of program completers two-and-a-half years after graduation (income tax data) and five years after graduation (UI wage record information) were compared to expected cohort group established by census data, broken down by program, age, and gender.
Major Findings	• 81% of graduates found in income tax database (two-and-a-half years after graduation) • 70% of graduates earned income in Wisconsin during Fall 1988 quarter (five years after graduation)
Future Directions	Uncertain at this point in time
Format of Report	Published research report

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Initially, this section presents the major findings and conclusions derived from the recent experiences of thirteen states in developing and using UI wage records to assess vocational education programs and policy. In addition, a set of recommendations are provided for federal and state policymakers relative to the expanded use of UI wage records. These recommendations focus, in large part, on improving the accountability mechanisms for vocational-technical education in an era of changing focus for programs, particularly at the secondary level. Finally, this section suggests several possibilities for promising development and demonstration initiatives which would explore the feasibility and utility of linking various administrative databases to monitor former student or graduate performance in the labor market or postsecondary education.

Findings

The findings which follow address three critical aspects of the effort in thirteen states to develop and use UI wage records: the initial authorization rationale, the various data sets employed in the studies, and the analyses conducted.

Authorization/Rationale and Cooperating Agencies

The impetus for undertaking studies of UI wage record data and their relevance to evaluating vocational-technical education programs comes from several sources. As noted in Table 14, *authorizing directives were most commonly in the form of pilot or feasibility studies and emanated from state legislatures, state boards of vocational education, and state departments of labor or economic security.* These directives were issued in most states in the mid to late 1980s and, in most instances, culminated in reports one to three years later. In a smaller number of states, there appears to be a *growing interest in developing better consumer information on vocational-technical education programs* by providing summary data on the labor market experiences of graduates.

Clearly the most comprehensive and significant authorization can be found in Florida where the legislature enacted a bill requiring the state department of education to use a job placement standard in funding vocational education programs and created the Florida Educational and Training Placement Information Program as the state's primary follow-up

data collection tool. A minimum job placement standard is to be met by those programs focusing on specific job preparation if they wish to continue to receive federal and state funding.

More commonly, state directors of vocational education in several states (Indiana, Oklahoma, Texas, Washington, and Wisconsin) *have funded feasibility studies to determine the adequacy of UI wage record data in their states for evaluating programs and services.* In some instances, social security numbers were collected and matched for statewide cohorts, while in other states the studies were done with a selected sample of schools or postsecondary institutions. Not surprisingly, more of these studies focused on postsecondary than secondary vocational education programs because of the wider availability of students' social security numbers. In Missouri, the state director funded an analysis of the UI wage record data in conjunction with a longitudinal study of the 1981 high school graduates.

In several states (New Hampshire, Virginia, Alaska, and Illinois), *the state department of labor or employment security (i.e., the state agency responsible for UI wage record reporting) has sought to initiate expanded use of the database.* Heads of these agencies viewed *the UI database as an underutilized resource impacting public policy.* In some instances, these agencies have worked directly with state boards of vocational education in planning and conducting studies, while in other states the department has conducted matching studies for selected schools or technical colleges.

In Arizona and Minnesota, increased concern from state legislatures for consumer information created the studies. Legislators in these states expressed interest in providing future students and their parents with more definitive information about the labor market experiences of students who had completed certain types of postsecondary vocational-technical education programs.

Since the collection and maintenance of UI wage record data is handled by a state department of labor in all but two of the states, collaboration with educational institutions or state education agencies *at some level is required* in order to complete analyses of the labor market experiences of graduates or former students. Throughout the thirteen states, various configurations of collaboration occurred, based on the structure of state government and the purposes of the study (see Table 14).

Table 14

Authorization/Rationale and Cooperating Agencies

STATES	AUTHORIZATION/RATIONALE	COOPERATING AGENCIES	SPECIFIC DATA FILES USED
Alaska	In 1987, the Alaska Department of Labor supplemented the UI wage record data with the Occupational Data Base to assess the economic impact of nonresident workers.	• Alaska Department of Labor	• UI wage record data • Occupational Database (includes four-digit occupational code and geographic area of employment)
Arizona	The Arizona Legislature required state officials to publish and distribute a report of placement rates and average salaries earned by postsecondary vocational education completers.	• Arizona Department of Employment Security • Contracted to the Center for Vocational Education, Northern Arizona University	• UI wage record data • Social security numbers of students in public and private postsecondary institutions
Colorado	In response to new state mandates for increased educational accountability, the Colorado Community College and Occupational Education System developed a longitudinal database to monitor postgraduation employment and continuing education.	• Colorado Commission on Higher Education • Colorado Department of Labor and Employment • Colorado Department of Local Affairs	• UI wage records • Higher education enrollment
Florida	Florida legislative directive enacting a placement requirement for public vocational education programs (job preparatory)	• Florida Department of Labor and Employment Security • Florida Department of Education	• UI wage record data • Databases of U.S. Department of Defense, U.S. Office of Personnel Management, U.S. Postal Service, state university system, community colleges, public schools (adult education), and state corrections

Table 14 (continued)

STATES	AUTHORIZATION/RATIONALE	COOPERATING AGENCIES	SPECIFIC DATA FILES USED
Illinois	In 1989, the Illinois Department of Employment Security established a longitudinal employment tracking system (ETS) which contains wage information, unemployment data, and Job Service contact information. In 1990, the Governor's Educational and Employment Subcabinet authorized a pilot study to conduct a combined evaluation of the state's various employment and training programs, including those overseen by the State Board of Education and the Community College Board. The ETS will be used in the Perkins System of Performance Measures and Standards for vocational education.	• Illinois Department of Employment Security • Illinois Community College Board • Nine other state agencies	• ETS data files on unemployment and wages for 1989-1990 • Social security numbers of completers
Indiana	The Indiana Commission on Vocational and Technical Education has sought accurate and timely information for planning, evaluation, and decision making. It continues to conduct pilot studies.	• Indiana Commission on Vocational and Technical Education • U.S. Department of Defense • Indiana Department of Employment and Training • Services/Unemployment Insurance • Indiana Commission for Higher Education	• Social security number matched for completers from five secondary vocational-technical education districts with active military personnel, enrollment in public postsecondary education institutions, and UI wage records
Missouri	UI wage records were used in a five-year longitudinal study of 1981 high school graduates sponsored by the Vocational and Adult Education Section of the Missouri Department of Elementary and Secondary Education.	• University of Missouri at Columbia • Missouri Department of Employment Security (DES)	• DES administrative files (UI wage records) • Social security numbers of 1981 graduates
New Hampshire	Beginning in 1987, the New Hampshire Department of Employment Security launched the New Hampshire Teenage Labor Market Study to examine the employment and education experiences of youth during their high school years.	• New Hampshire DES	• UI wage record data • High school transcripts
Oklahoma	The Oklahoma Department of Vocational and Technical Education sought to examine the feasibility of matching student records to employer wage records to assess vocational completer labor market outcomes.	• Oklahoma Department of Vocational and Technical Education • Oklahoma Employment Security Commission	• 1986-1987 state generated vocational completer list • 1988 hourly and wage records of the Oklahoma Employment Security Commission

Table 14 (continued)

STATES	AUTHORIZATION/RATIONALE	COOPERATING AGENCIES	SPECIFIC DATA FILES USED
Texas	Two major studies have been done in Texas to examine the feasibility of using UI wage records to demonstrate the outcomes of public education and training programs.	• Texas Occupation Information Coordinating Committee • Texas Higher Education Coordinating Board • Texas Employment Commission (TEC)	• UI wage records • Completing and nonreturning student records from four postsecondary education institutions
Virginia	Over the last three years, the Virginia Employment Commission has indicated to various state agencies the availability of the UI wage record data. Reports have been done for the community colleges, high schools, and JTPA programs.	• Virginia Employment Commission • Virginia Community College System	• UI wage records • Social security numbers of community college graduates
Washington	The Washington Board for Community College Education sought to conduct a pilot study of the feasibility of using employment security and higher education files to track the employment and education outcomes of vocational education program completers.	• Department of Employment Security, Office of Financial Management	• UI wage records (Washington, Alaska, California, Idaho, and Oregon) • Higher education student records
Wisconsin	Study commissioned by the Wisconsin Board of Vocational, Technical, and Adult Education to the University of Wisconsin at Madison.	• Wisconsin Department of Industry, Labor, and Human Relations (WBVTAE) • Wisconsin Department of Revenue	• UI wage record files • State income tax data • WBVTAE student record files

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In some states, the comprehensiveness of the study required collaboration from a number of agencies—for example, in Florida and Washington the UI wage records are only one source of data for examining the postprogram experiences of vocational education students. Accessing data from other sources such as higher education institutions and federal employers such as the Postal Service or the military, requires that these agencies provide employment, earnings, enrollment, and other types of information. In several of these studies, new state-level data sharing agreements have been established.

Across the thirteen states included in this study, *collaboration and data sharing exist between state agencies, between federal and state agencies in a few states, and between state agencies and local schools or postsecondary institutions.* In some states (Florida and Washington in particular) there are indications that data sharing by state agencies in adjoining states is beginning to be seriously considered. Multistate data sharing will enable states to track the mobility of graduates or former students.

In four states (Arizona, Missouri, Texas, and Wisconsin), *the actual studies were conducted under the auspices of a grant or contract with a university-based research group. These approaches were used as a matter of convenience or efficiency, since the state agencies or state boards lacked the specialized expertise, staff time, or resources to conduct the studies internally.*

Data Sets—Demographic, Employment, and Educational Information

Table 15 identifies the specific data files that were matched in each of the thirteen states conducting studies. These data files contained a variety of demographic, educational, and employment data on a target group of former vocational education students.

In these studies, the target groups ranged from two-hundred secondary vocational education graduates of a specific school in Oklahoma to a statewide total of nearly two-hundred thousand students of programs in Florida including secondary, postsecondary, JTPA, corrections, and other programs.

In most cases, the target group was a cohort of students, usually completers or graduates, from a particular academic year. *Most frequently, the target group included postsecondary vocational education graduates wherein expectations for employment are strongest,* that is, postsecondary programs are generally more occupation-specific where

secondary programs may tend to be both exploratory and occupation-specific. In New Hampshire, however, a five grade-level cohort (8th through 12th) was followed for four years. This study provided a longitudinal view of the interaction between work and educational experiences for high school youth. Some studies focused on all or a representative sample of students enrolled in vocational education during a specific time frame—not just program completers. In Texas and New Hampshire, the studies sought to analyze the labor market experiences for completers of different amounts of postsecondary vocational education or for those student enrolled in academic, general, or vocational tracks in high school.

Since many of the studies were initial pilot efforts, extensive demographic data on students was not used. In most instances, only the social security numbers were used in matching the UI wage records. However, several studies with more sophisticated analysis plans (Florida, Colorado, Virginia, Washington, and Wisconsin) *were able to contrast their findings by gender, age, and ethnicity.* Less frequently found were analyses based on proficiency in English, disabling condition, or economic status while enrolled. Analyses of employment experiences prior to or during enrollment in a community or technical college program were conducted only in Washington. When refined, such an analysis will provide a clear indication of the economic value of certain types of postsecondary vocational-technical education.

The educational data and information used in these studies varied considerably, depending on the purpose and sophistication of the study. Most of the studies identified either the institution and/or the vocational-technical program in which students had been enrolled. In some of the studies, the Classification of Instruction Programs (CIP) code (used by the U.S. Department of Education) or a state or local program designation was used to indicate the specific type of vocational education the student had received. *The CIP codes were used in Texas and Oklahoma in an attempt to examine the relatedness of training received and employment. In other states* (Alaska, Indiana, and Missouri), *the educational data was compiled to reflect the labor market experiences of students completing programs at secondary area vocational-technical centers* (specialized schools) *without regard to whether training was received in agriculture, business, marketing, or other fields.* Similarly at the postsecondary level, aggregate numbers were compiled for associate degree or certificate completers.

Table 15

Demographic, Employment, and Educational Information

STATES	VOCATIONAL EDUCATION TARGET GROUP/SIZE	DEMOGRAPHIC DATA	EDUCATIONAL DATA	EMPLOYMENT DATA
Alaska	Two studies have been done for local vocational schools—one secondary using 259 completers from 1987 and one postsecondary with 204 graduates from 1989.	Age, ethnicity, gender	Occupational education course title or cluster, dates of training, geographic region of training	• Occupational (4-digit) code, industry of firm, quarterly wages, average earnings (one & three years), location of employment
Arizona	All fifteen community colleges, two skill centers, and forty-two private schools providing postsecondary vocational-technical education provided social security numbers for completers during 1983-1984.	None	Institution, vocational-technical education program (independently defined), number of completers per program	• 1984-1985 earnings
Colorado	Initial study focused on 3,797 associate degree and certificate recipients from 1985-1986.	Gender, age, and ethnicity	Type of college attended, degree received, higher education status	• Work status, earnings profile
Florida	Annual summary of vocational education graduates/1988-1989 graduates n=196,665 which includes all secondary and postsecondary graduates in schools and institutions	Race, gender, age, handicapping condition, and socioeconomic data	Institutional base of program (e.g., secondary school district, community college), vocational program, completer/leaver/ special student status	• Occupational code, number of weeks worked, amount earned, county location, industry of employment, size of employer, employment in federal government (personnel, military, postal service), enrollment in university or community college
Illinois	Occupational program completers in community college programs for 1988-1989/n=15,485	None	Completion of an occupational education program	• Employment during four quarters following graduation • Retention in employment for consecutive quarters • Quarterly earnings
Indiana	1988-1989 completers from five secondary vocational education programs/n=1,497	None	Occupational program title	• Employment (third and fourth quarter of 1989), military enlistment (as of September 1989), and enrollment in higher education (in 1989-1990)

Table 15 (continued)

STATES	VOCATIONAL EDUCATION TARGET GROUP/SIZE	DEMOGRAPHIC DATA	EDUCATIONAL DATA	EMPLOYMENT DATA
Missouri	1981 graduates of secondary vocational-technical education centers/n=705	None reported	Completion of a secondary vocational-technical education program	• Services received from DES • UI insurance claims information • Wages for selected quarters • Number of quarters worked since graduation
New Hampshire	Five grade-level cohorts (grades eight through twelve) were followed from four years (1987-1990)/n=1,220. This was a statewide representative sample of the population of students in grades eight through twelve. Of the students in the sample, 107 were in the vocational education track.	Gender, region of high school in the state (three regions)	Transcripts provided by high schools indicated the track of each student included in the sample (vocational, general, academic, and unknown)	• For 1,140 useable wage record files—employment by quarter (1987-1990), quarterly hours worked, annual and quarterly earnings, and standard industry classification (two digit)
Oklahoma	1986-1987 vocational education completers/n=14,907; secondary, 10,888 or 73.1%; and adult, 4,019 or 26.9%	None	Vocational-technical education program (CIP code)	• Employed during one or more quarters in 1988 and the SIC code
Texas	Completers and nonreturning postsecondary vocational-technical education students in 1988 program year from four institutions/n=8,162	None specified	Program completion status (completer or nonreturning), instructional program completed/started (CIP code)	• Employment by industry (3-digit SIC code), median quarterly earning
Virginia	1985 graduates of the Virginia community colleges/n=6,210 matched records	Gender, age, race	Instructional program, degree, credits, campus, college, and graduation year	• Average annual wages (based on five quarters—Quarter 1 of 1986 through Quarter 1 of 1987)
Washington	Postsecondary vocational education program completers for 1987-1988/ n=14,096	Age, gender, ethnicity, disability, limited-English proficient (LEP)/ disadvantaged indicator	Instructional program by CIP code, quarter/year started, quarter/year last enrolled, exit status, and other data	• For the first quarter of 1989—the workforce status (employed or unemployed), SIC code, employment location, estimated annual earnings, business size, hours worked during quarter, upgrade/retraining indicator, and employment related to education indicator (SIC/CIP match)

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Table 15 (continued)

STATES	VOCATIONAL EDUCATION TARGET GROUP/SIZE	DEMOGRAPHIC DATA	EDUCATIONAL DATA	EMPLOYMENT DATA
Wisconsin	1982-1983 graduate of Wisconsin's sixteen Technical Colleges/n=15,959	Gender, age, and region of the state	Instructional program area, length of instruction, and disadvantagement	• 1985 Wisconsin income tax data • 1988 Fall quarter wage record data

Unfortunately, several of the reports which used aggregate data at some level above the local school cited major flaws and inconsistencies in the educational program data. *Especially at the secondary level, local school officials are generally inconsistent in their designations of such basic elements as "vocational education student," "completer," or "leaver."* In Arizona, which studied the earnings of postsecondary graduates across several institutions (both public and private), each institution was permitted to use its own designation of programs, which considerably limited the interpretation of the data. Without consistent and uniform definitions of vocational-technical education program completion, it is difficult to intelligently utilize labor market information in any analysis of program effects. If uniform and precise definitions are not used in these studies, analyses of transcripts should be considered to determine the nature and extent of coursetaking patterns and their relationships to labor market or further education experiences.

The employment and earnings data found in the UI wage records were the centerpiece of the data collections in most of the studies. In Florida and Alaska, the UI wage records are supplemented with occupational title and the county of employment. *The UI wage record data of primary interest in the studies included work status (employed or unemployed), quarterly earnings (in some studies this data was aggregated over four or five quarters), the Standard Industrial Classification (SIC) code in which former students were working (a rough indicator of training relatedness), mobility across industries over time, and the location of employment.*

In addition to UI wage record data, three states collect and compile information on the participation of former vocational education student/completers in higher or postsecondary education. Florida monitors enrollment of former secondary vocational education in community colleges and state universities. Colorado monitors whether or not postsecondary students have enrolled in other higher education programs and received degrees. In its pilot study, Indiana monitored the higher education enrollment of its secondary graduates.

Analyses Conducted

As noted in Table 16, *most of the reports reflected analyses of how well program graduates performed in the labor market.* The common analyses reflected what percentages of the graduates were employed and their quarterly or annual earnings. For the most part, these were descriptive reports compiled for statewide samples of graduates from selected

programs or, in some cases, all vocational-technical programs of a certain type (e.g., postsecondary) (Arizona, Colorado, Illinois, Washington, and Wisconsin). In three states (Alaska, Indiana, and Texas), the data was compiled and analyzed for selected schools or postsecondary institutions.

Generally, the reports reflected the following analyses:

- Employment rates and quarterly earnings of associate degree graduates across various postsecondary vocational-technical programs (Arizona and Virginia)

- Earnings and employment patterns of vocational education students or graduates over time using longitudinal measures and comparing their performance to nonvocational students (Missouri, New Hampshire, and Wisconsin)

- Comparisons of completers and nonreturning postsecondary vocational-technical students in terms of percent employed, median or mean quarterly earnings, and inter-industry mobility of former students (Texas)

- Comparison of employment patterns and earnings of associate degree graduates with graduates of JTPA and other employment and training programs (Illinois)

- In Florida and Alaska, where occupational titles were also collected from employers (in Florida, independent of the UI wage record), the training-related job placement rates for specific programs were calculated. In Washington and Oklahoma, analyses were conducted matching the industry of employment (SIC code) with the instructional program title (CIP) which the student had completed. Since vocational-technical education programs are occupation-specific rather than industry focused, the latter approach provides only an indirect measure of training-related placement.

- Analyses of employment patterns and income prior to, during, and following completion of a postsecondary vocational program provide an indicator of the extent to which such programs provide skill upgrading/retraining benefits for certain industries (Washington)

- Analyses reflecting the percentage of graduates or leavers who enrolled in postsecondary or higher education (Colorado and Florida)

Table 16

Analyses, Findings, and Future Directions

STATES	ANALYSES CONDUCTED	MAJOR FINDINGS	FORMAT OF REPORT	FUTURE DIRECTIONS
Alaska	Reports are done for individual schools and institutes—comparisons of earnings of secondary vocational education concentrators with overall age group cohorts and pre- and postprogram earnings comparisons for postsecondary vocational-technical education completers.	In the secondary school study, 25% of completers were working in occupations related to training and their earnings exceeded the earnings of their age cohorts who did not receive vocational education. In the technical institute study, 48% of the completers were employed in training related occupations and their postprogram earnings were 115% of preprogram earnings.	• Individual reports are prepared for schools and technical institutes and are available for the Alaska Department of Labor	Cooperative agreements have been reached with other state agencies to use the UI and ODB data to evaluate JOBS and the State Employment and Training Program (state-funded).
Arizona	For each program within an institution: number of completers in Arizona, number and percentage with earnings, average earnings, and median earnings.	The lack of uniform definitions for postsecondary vocational education programs in this study limits the utility of the findings. Several private schools do not collect social security numbers.	• Published report for 1986	Additional consumer-oriented studies have not been undertaken. Substantial concern exists regarding the use of social security numbers for the evaluation of programs. Currently there are no plans to continue additional development.
Colorado	Data tables are developed by CCCOES and forwarded to each postsecondary institution for use in program review and accountability reports.	For the 1985-1986 graduating class: nineteen percent were enrolled in higher education, fifty-eight percent were in the UI wage record file (i.e., employed) one year after graduation, and twelve percent of those employed were both working and going to school.	• Research report prepared by a state agency official for a regional conference	Reports are provided to local community colleges upon request.

Table 16 (continued)

STATES	ANALYSES CONDUCTED	MAJOR FINDINGS	FORMAT OF REPORT	FUTURE DIRECTIONS
Florida	Publishes earnings based on full-time, full-quarter employees. Also reports the percentage of people who were full-time, full-quarter employees from specific programs.	Sixty-four percent of graduates were employed in Florida businesses, two percent were federal employees or in the military, twenty percent were continuing their education.	• Published annual report • Catalog of standard reports • Targeted studies	Maintain the program, investigate using neighboring states' wage record systems, and explore new ways of identifying "no find" students.
Illinois	Percent employed in quarters one through four following graduation. Percent remaining employed for two, three, or four quarters. Average earnings for those graduates employed each quarter.	Seventy percent of the graduates were employed; retention in employment in subsequent quarters declined from ninety-one percent (Quarter 2) to eighty-two percent (Quarter 4); average quarterly earnings increased from $4207 to $4621 during the first two quarters following graduation.	• Technical Report of ETS multi-agency pilot study	The State Board of Education will be using the ETS database to monitor employment and earnings of vocational education graduates as part of the Vocational Education System of Performance Measures and Standards. Consideration is being given to requesting the inclusion of occupational title in the database.
Indiana	Sample aggregate reports were prepared for each of the five area secondary programs. For each of the matched employees, the ICVTE contacted employers for occupational titles and the county of employment.	Overall, seventy-one percent of the completers in the initial pilot were found in one of the three databases. Specifically, sixty-six percent were found in the wage records, sixteen percent were in higher education, and three percent were in the military.	• Memoranda prepared by staff members for the Indiana Commission on Vocational and Technical Education	The recent establishment of the Indiana Department of Workforce Development will most likely call for more interagency evaluation and accountability initiatives such as this.
Missouri	Comparisons of employment data for graduates of vocational education programs and graduates of nonvocational education programs.	Graduates of vocational education programs showed consistently higher average fourth quarter earnings from 1981-1985 compared to nonvocational graduates. Vocational education graduates were employed more consistently than nonvocational education graduates.	• Two research reports are available, including a summary report on the longitudinal study and a special report on the analysis of the DES data	None indicated in the reports.

Table 16 (continued)

STATES	ANALYSES CONDUCTED	MAJOR FINDINGS	FORMAT OF REPORT	FUTURE DIRECTIONS
New Hampshire	The employment data was analyzed for each of the five cohorts over the four-year period with attention to the high school program tracks.	Ninety-nine percent of the 1989 seniors were formally employed at some time during 1987-1990; seventy-one worked in at least three quarters. Students in a vocational or general education program worked significantly more hours per week than academic track students, primarily in retail trade industries. The 1990 economic downturn in New Hampshire has had a profound effect on youth employment which may affect future employment and income stability.	• Series of three research reports published by the New Hampshire Department of Employment Security (see Yasuda, 1991 [Appendix D])	A major recommendation in the report suggests that several state departments (education, postsecondary technical education, and employment security), the university, and the SOICC design and use a database integrating the employment and education histories of New Hampshire youth, using UI wage records as the core.
Oklahoma	Number of completers who worked in 1988, number of completers who worked in the same industry in each quarter, and employment of completers in specific SICs overall and by specific occupational division.	Seventy percent of the completers worked at some time in 1988. The percentage of adult completers who maintained stable employment and same-industry employment in 1988 was higher than for secondary completers. Ten SICs employed forty-two percent of all completers.	• Research report available from the Oklahoma Department of Vocational and Technical Education	None indicated.
Texas	Comparisons of completers and nonreturning students on the following: percentage employed versus unemployed, employed in the same or different industry over five quarters, and median earnings over five quarters.	Approximately eighty-five percent of the former students were found in the UI wage record data during the five quarters. Nonreturning students appeared to be more likely to be employed while attending school, which may have adverse effects on their ability to complete the programs.	• Research report on the pilot study, Center for the Study of Human Resources, University of Texas at Austin	Citing significant cost savings over conventional mail or telephone follow-up studies, the report recommends that the Texas Higher Education Coordinating Board work with the two-year institutions to adopt and expand the use of administrative records such as UI wage records and other data on a permanent basis.

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Table 16 (continued)

STATES	ANALYSES CONDUCTED	MAJOR FINDINGS	FORMAT OF REPORT	FUTURE DIRECTIONS
Virginia	Earnings data was reported by the curriculum area of the graduates.	Engineering/industrial technology graduates had the highest earnings, ($24,260) and agricultural graduates had the lowest ($16,071). Differences in salaries between male and female graduates were also reported.	• Report published by the Virginia Employment Commission, August 1988	Use of the UI wage records is being considered by the Perkins Committee of Practitioners.
Washington	Training related to industry code (SIC/CIP). Upgrade/retraining indicator (whether employee worked prior to, during, or following training in the same firm and/or industry).	Sixty-seven percent of completers were matched in the UI wage record database. Sixteen percent of the completers had two or more employers during the analysis quarter. The UI wage record match process provides slightly more information than traditional follow-up studies at considerably less cost and with significantly less nonresponse bias.	• Operations report available from the Washington State Board for Community and Technical Colleges, October 1990	Outcomes data are being reported annually in eighteen occupational program clusters at the state and institutional levels. Five-year averages are developed annually for employment, earnings, and other outcome variables.
Wisconsin	Earnings of program completers two and a half years after graduation (income tax data) and five years after graduation (UI wage record information) were compared to expected cohort group established by census data, broken down by program, age, gender, and so on.	Eighty-one percent of graduates found in income tax database two and a half years after graduation. Seventy percent of graduates earned income in Wisconsin during the Fall 1988 quarter, five years after graduation.	• Published research report	Uncertain at this time

This array of analyses illustrate the variety of comparisons of interest to researchers who, for the most part, were experimenting with the UI wage record database for the first time. The more sophisticated analyses were dependent upon crosswalks with other administrative databases such as the U.S. Department of Defense military personnel database or state higher education databases. The availability of the UI wage records enables researchers and evaluators to conduct a number of highly cost-effective, reliable analyses which address important questions for program planning, development, and budgeting.

The most useful analyses are dependent upon carefully constructed independent variables describing the type and amount of vocational education received. For example, specific and uniform definitions of vocational education completers are necessary to accurately compare the employment rates of vocational and nonvocational education students statewide. Sorting out the effects and outcomes of vocational education programs by examining labor market information requires maintaining comprehensive student records, containing such information as current program and course titles, the amount of work experience credit completed, related academic courses completed, special services received (e.g., career planning and assessment) and special student status (e.g., disabled, disadvantaged, LEP). Labor market outcomes described in relation to these components provide precise and reliable direction for program improvement.

Conclusions

In examining the findings, a number of general conclusions and policy lessons can be gleaned. The conclusions which follow offer insights regarding the general utility and coverage of the database, the future directions likely to be taken by states, local use of UI wage record information, technical concerns, uniform definitions, and training-related employment analyses. The final section of conclusions focuses on what these states have learned relative to general implementation (e.g., efficiency gains, regional [multistate] analyses, useful comparisons, and linking to other databases).

Most of the studies from the *thirteen states concluded that using UI wage records was a significant improvement over traditional follow-up studies in compiling information on the labor market performance of vocational-technical education graduates.* Generally,

mail follow-up surveys have low response rates and are plagued with potential response bias problems. While there are significant constraints in the UI wage data (most notably the lack of occupational titles of employment), *the cost savings associated with the more comprehensive and longitudinal data set make the UI wage record data a valuable resource.*

In general, *through the UI records, sixty-five to ninety percent of the graduates or former students were identified as in the labor market.* As one might anticipate, *the percentages of former students employed were higher for graduates of postsecondary programs than for secondary programs.* In those states where higher education enrollment was matched, *fifteen to twenty percent of the former vocational education students were pursuing further education.* Those studies examining multiple quarters found a higher percentage of graduates in the labor market than did studies which examined only one or two quarters of employment. In Florida and Alaska where training-related placements were determined, approximately fifty percent of the graduates of postsecondary vocational-technical education programs were working in jobs for which they had trained. More specifically, in Florida, about eighty percent of postsecondary vocational completers are found. This data includes employment (about 70%) and continuing education (about 25%). There is about a fifteen percent incidence of overlapping employment and continuing education. About seventy-five percent of the employment, or seventy-five of the seventy percent, is typically training-related. Training-related placement rates were lower for secondary level vocational education graduates.

In the two states where pre- and postprogram earnings were compared, the graduates of postsecondary vocational-technical programs were earning more following their programs. In general, graduates of postsecondary vocational-technical programs were earning more than comparison groups and nonreturning students.

Future Directions of States

In general, *the thirteen states reviewed in this study are each considering future uses for the UI wage records in evaluating vocational-technical programs. To date, four states (Alaska, Colorado, Florida, and Washington) have implemented provisions for ongoing use of the UI wage records.* In two other states (Illinois and Indiana), the plans are being finalized for implementing employment tracking of vocational education graduates using the UI wage records. While the remaining states report a generally favorable response to the

pilot testing or occasional reports for economic and/or political reasons, plans for the further development and use of the UI wage records remain stalled.

The 1990 Amendments to the Perkins Act require state boards to develop, in consultation with a Committee of Practitioners, a system of performance measures and standards for secondary and postsecondary vocational technical education programs receiving federal assistance. The final rules for the Perkins Act (*Federal Register*, "Rules and Regulations," 1992) allows recipients to evaluate annually the effectiveness of the entire vocational education program, regardless of which particular projects are assisted with federal funds. *While this could be seen as an excellent opportunity for states to consider the use of the UI wage record data, it appears that only a handful of the thirteen states included in this study have moved to include the UI wage records in their performance assessment system.* Only Illinois, Florida, and Washington definitely plan to use the UI wage record data. Washington will use the data for postsecondary measures and standards and possibly for secondary program measures if social security numbers can be obtained. Three states (Colorado, Missouri, and New Hampshire) have indicated that they will definitely not use UI wage records, citing a preference for traditional follow-up studies and/or the lack of agency control of the UI data as major constraints. The remaining states are in various stages of considering the possibility of using the UI data.

Beyond the new Perkins Act requirements for assessment in vocational education, *several states were using or planning to use the UI wage records as a broad indicator of education and training accountability.* In Florida and Virginia, the UI wage records have been used in analyzing education and training outcomes across several agencies, including JTPA programs, higher education, community college programs, corrections, and adult migrant programs. *In Washington and Indiana, the recent creation of new state workforce preparation commissions/boards has spawned considerable interest in examining client outcomes across several education and training programs designed to improve the readiness of the state's workforce.* In these states, the *restructured policy and governance arrangements will supposedly facilitate greater coordination and place a premium on knowing more about client success in the labor market.* State officials from each of the thirteen states in this study indicated there was a strong interest in using employment data as a general indicator of education and training effectiveness.

Local Use of UI Data

In the states where institution-specific summaries of UI wage record data are available (Alaska, Colorado, Florida, Illinois, Indiana, and Washington), *there appears to be considerable interest on the part of local administrators. However, in those states where it is possible to have the state UI wage record agency run special studies or specific analyses of the data for a given program or institution, only a handful of schools have requested such studies.* In a few instances, state administrators interviewed for this study reported growing interest by local officials in using the matched employment and earnings data to evaluate programs. It appears that local administrators and policymakers are generally unfamiliar with the availability of this data and lack knowledge about the procedures for accessing and using the data in conducting local evaluations and decision making. *States which move forward in expanding the use of UI wage records and other automated databases need to pay close attention to training administrators to ensure that the analyses and report formats used do indeed respond to the critical information needs of local policy boards and administrators.*

Technical Issues

As with any other major database, a number of operational and technical issues are found in using and interpreting the information and data. Issues common to the UI wage records and their use in vocational education include the following: use of uniform definitions, confidentiality and corresponding safeguards, data reliability and accuracy, and data comprehensiveness. In the follow-up telephone interviews, these issues were explored with the state officials directly responsible for the UI wage record initiative pertaining to vocational-technical education.

Confidentiality and Corresponding Safeguards

In each of the states where work has been undertaken, *the development of safeguards to protect the confidentiality of individuals and employers was a major concern. However, it is important to note that these concerns were successfully resolved and the studies were implemented. In no instance was the issue of confidentiality an insurmountable barrier.*

In some states, the state agency responsible for the UI wage record data has developed data sharing agreements which require the names of individuals and firms to be removed from all data, require cooperating agencies to produce a listing of social security

numbers for the population of interest, and provide cooperating agencies with requested data tables in which minimum cell size (e.g., 5 or 10 cases) are required. In some other states, the agency responsible for the UI data actually conducts the analyses and prepares the reports to assure that confidentiality standards are met.

In smaller states, it appears that the minimum cell size safeguards raise problems when attempting to examine the labor market participation and earnings of minority populations, which are originally small in number.

Those states doing longitudinal analyses of the data while students were still in high school found it was necessary to obtain parental permission prior to accessing the information. In both states, this requirement did not significantly diminish the sample size.

While issues of confidentiality were successfully addressed in these state-level initiatives, they are likely to persist as states continue to look for ways to examine the effects of individual local programs. In small or rural counties, for example, if minimum cell sizes are maintained for each of the industries reported in the state's data, it may be difficult to find a minimum of five or ten employers in manufacturing or similar industries. As state and local officials move toward a more fine-grained analyses of the data, the issues of confidentiality will remain salient.

Data Reliability and Accuracy, and Data Comprehensiveness

Several groups of workers are not included in the UI wage records in most states. Those excluded include workers who are self-employed, railroad employees, some agricultural workers, and employees of some nonprofit organizations. *Among the thirteen states included in the study, some cite the lack of comprehensiveness as a problem.* It appears that in larger states *such as Texas or California which have economies that are predominantly rural and agricultural, or which have heavy concentrations of self-employed workers, these demographic patterns may present significant limitations to using the UI wage records.* In other states, such as Florida, where multiple databases are used, the prospects of matching nearly all (i.e., 95% or greater) of some program graduates is higher and thus the confidence in the data is higher in terms of predicting the postprogram labor market status of graduates. However, most states in the study did not indicate that the exclusion of some groups of workers from the UI wage records was a significant problem.

Some states have initiated traditional mail or telephone follow-up procedures to locate those former students not matched.

State personnel who were interviewed reported a host of issues surrounding the validity and reliability of the UI wage record data in their state. The following list of issues arose in the discussions:

- Some employers cite themselves as being in the SIC which has the lowest taxation rate.
- One state estimates that perhaps ten percent of employers simply do not report UI wage record data and state-level monitoring efforts are not sufficient to reduce that number.
- Another state reports that employers have as much as a ten percent error rate in entering social security numbers and other data.
- In some states there appears to be as much as six months of lag time in receiving printouts from the agency managing the data system making it difficult to produce timely reports for local schools.

States such as Florida that have worked for an extended period of time with UI wage record data have developed strategies for monitoring the quality of the data. These strategies include checking social security numbers against the Social Security Administration's list of unassigned numbers. In Florida, response analysis visits are made to a random sample of approximately twenty-five businesses annually to examine their payroll and reporting systems and to verify that the information gathered through matching and employee contact have been accurately reported and handled.

Another salient issue is the availability and use of social security numbers (SSNs). Clearly, this is an issue focused largely on secondary level vocational education programs. In this set of thirteen states, most of the studies pertained to postsecondary vocational-technical education programs in which SSNs were readily available because these institutions used the SSN as a student identification number. However, not all postsecondary institutions require students to have SSNs. Obviously, to match UI wage records there must be a set of social security numbers provided by the educational

institutions. In states where the pilot or feasibility studies focused on high school vocational programs, it was reported that only one-third to one-half of the students had SSNs. In some states, state laws or state requirements for receiving vocational education funds require SSNs to be collected for high school or vocational high school students. When the latter strategy is used, making comparisons on the labor market involvement of vocational education students and nonvocational students is possible.

Overall, most states in the study did not see this as a problem, but argued instead that the quality and comprehensiveness of the UI wage record data was the strength of the data system. The UI wage records are not a panacea for evaluators and policymakers concerned with vocational-technical education. In each state, care must be taken in examining the quality and comprehensiveness of the UI wage record data. The problems of generating social security numbers for current and former students should also be considered by anyone planning to use the database.

Uniform Definitions

Perhaps *the biggest challenge in using the UI wage record data lies in knowing specific information about the vocational-technical programs and/or the students who completed them.* The issues of how "vocational education programs" or "completers" or "vocational students" are defined is long-standing and complex. Some states have precise definitions that must be followed in local reporting in order for local schools or technical colleges to receive funds. In other states, schools can decide within general guidelines which courses and how many courses constitute the completion of a vocational program at the high school level. The problems of uniform definitions appear to be less complicated at the postsecondary level, but the issue still exists in several states.

In the data reported in this study, it appears that the lack of uniform definitions was and is a significant issue in those states attempting to do statewide aggregation (i.e., to draw some conclusions about the effects of vocational education programs at the regional or state level). However, for states such as Alaska and Virginia, where studies were run by the state agency upon the receipt of requests from specific schools or technical colleges, the assumption was made that these institutions can readily describe the specifics of their programs. In some states, the reports have cautioned readers against making comparisons across institutions because of uncertainties regarding the content of the vocational-technical programs.

In statewide analyses, separate governance of the vocational education programs (i.e., secondary versus community colleges) creates lack of consistency in describing programs and students. As governance structures begin to change or realign themselves, one of the major concerns has focused on building common data systems, which would require adult education JTPA, and secondary and postsecondary vocational-technical programs to "work toward developing a common core of definitions and data reporting elements" (Paris, 1991, p. 24).

In the states reported herein, the Committees of Practitioners and several inter-agency workgroups have been formed to study the issue, but it appears that only a few states (Colorado, Florida, and Washington) have made significant progress in building a set of uniform, state-level definitions. In general, the states who have worked most extensively on the matching of UI wage records understand more fully the problems of uniform definitions for vocational education. These states have developed various approaches for assuring quality of the information used to describe the vocational programs of the students and have taken precautions to make informed judgments about the labor market experience of students and their programs.

Relatedness of Training to Employment

Closely related to the issue of uniform data is the matter of linking the type of program completed to the use of acquired skills and knowledge in the labor market. *From the perspective of many labor economists, policymakers, and vocational educators, vocational-technical education programs only yield economic dividends for society if the trainees fully utilize the competencies gained in related jobs. Historically, employment in a training-related job has been the dominant criterion for judging the effectiveness of vocational-technical education at both the secondary and postsecondary levels. However, this issue has been confounded by the recent Perkins legislation which charges vocational-technical education programs with a broadened emphasis on occupational and academic skill development.* Others within the field have contended for nearly a century that the purpose of vocational education is broader than preparing people for specific occupations and encompasses developing general employability; consumer and homemaking skills; career awareness and exploration; broad understanding about business, technology, and the economy; and avocational interests.

Since individual vocational programs are structured around occupations (e.g., nursing) rather than industries (e.g., health services), it is technically impossible to determine the precise training-related match unless occupational titles are collected from employers. In Florida and Indiana, occupational titles are collected from employers on a regular basis through supplemental or follow-up surveys. In Alaska, the collection of occupational title was mandated by state legislation and has been part of the UI wage record system for several years.

Six states have attempted to analyze and report employment patterns by the SIC codes and relate them to the CIP codes used by the U.S. Department of Education. With the exception of Washington, the respondents indicated dissatisfaction with this analysis. Agency personnel in Washington have developed a protocol which interfaces eighteen CIP clusters with various SIC codes. The reports provided to community and technical colleges provide an indication of the percentage of former students working in training-related jobs. In one state, the reporting of high percentages of graduates as employed in "eating and drinking establishments" caused considerable controversy. Another state has suggested that additional crosswalks be developed through which industry codes and occupational codes could be linked and the resulting occupational codes aligned with CIP codes for vocational-technical programs.

In general, the vocational education researchers and state officials who have been involved in these analyses cite the inability to make an adequate link to the training-relatedness issue as the major limitation of the UI wage record data. *Without state-mandated collection of occupational title data or valid interpretive crosswalks, most arguments do not support widespread use of the UI wage record data to answer the key questions about the contribution of vocational programs to economic productivity.* However, the limitations must be considered in light of the broadening mission of vocational education in many states and communities.

General Implementation Considerations

Efficiency Gains

One of the major benefits of using the UI wage records is the anticipated savings over the high costs of collecting follow-up information through surveys. The Office of Technology Assessment (1989) reports that twenty-seven states use follow-up surveys to

collect data on job tasks, employers' assessment of job performance, as well as information on wages. In four of the states reviewed in this study, requirements to conduct follow-up surveys were eliminated or suspended. In one state it was noted that nearly twenty percent of the community and technical colleges continue to conduct follow-up information via surveys which they find particularly useful. Two additional states indicated they planned to eliminate the follow-up requirement for local schools or postsecondary institutions. The remaining states indicated that state-level follow-up requirements were either non-existent or implemented in a highly permissive manner by the state board for vocational education.

Clearly, *there has not been a rapid, national shift to replace follow-up surveys with automated database matching in most states, in contrast to what some projections in the mid-1980s suggested.*

Reaching Adjacent States

Since mobility factors are prominent in the workforce, several states have examined the feasibility of sharing UI wage records. The ability to locate graduates and former students in adjacent states is particularly crucial in small states (e.g., New England) and in large metropolitan areas that span state borders (e.g., St. Louis-Kansas City, New York-New Jersey-Philadelphia).

Washington has developed data-sharing agreements with Alaska, California, Idaho, and Oregon and monitors regional mobility of graduates on a regular basis. Other states in the sample (Colorado, Florida, and New Hampshire) have pursued discussions with surrounding states, but report limited success in reaching the point of developing data-sharing agreements. The remaining states had only begun to consider this possibility. *The problem is complicated by incompatible UI wage data and states having different views on the utility of shared UI wage record data.*

Comparisons and Analyses

As noted earlier, the employment and earnings data available in the UI wage records only have utility when they are interpreted in relation to specific types of students or educational programs. Using the UI wage record data as outcome measures for vocational-technical education programs, *the states in this study made a variety of comparisons and analyses as follows:*

- Missouri and New Hampshire *compared secondary vocational education students/graduates with other groups of high school students/graduates over a five-year longitudinal period* to determine the extent to which vocational education courses/programs accounted for differences in employment rates, industry of employment, and earnings. Other states in the study indicated *the longitudinal tracking capabilities of the UI wage records are valuable for understanding the long-term effects of programs upon labor market performance.*

- *Several states* (Colorado, Florida, and Washington) *have compared the employment patterns to standards that were legislatively mandated for vocational education programs or training-related job placement rates* that emerged from traditional follow-up studies. The expectation here is that programs with low training-related placement rates should be phased out and considerable savings in public costs are realized.

- States are also interested in *drawing comparisons for different types of students. Understanding the extent to which labor market outcomes are different for male/female, low-income, disabled, incarcerated, and unemployed/employed adults can assist policymakers and educators in developing appropriate support services* for these groups while they are enrolled in vocational-technical programs. Further, *such analyses are essential in informing policies and priorities for other human service agencies such as the Job Service,* Welfare, and Vocational Rehabilitation.

- In Washington, the labor market performance of adults was compared prior to, during, and following their participation in various community and technical college programs. Such analyses provide rough proxies for determining the economic productivity effects of job-specific training programs in particular industries.

Linking to Other Databases

Beyond the UI wage records, several states have identified other automated databases which can be accessed using social security numbers. Florida is clearly the pioneer in this arena, having developed a system for linking with data files in higher education, military services, higher and adult education, corrections, and federal employment. Other states have been able to link social security numbers of students and graduates with databases in higher education, military personnel, and state income tax records.

States involved in multi-agency matching processes note that the negotiations are generally long and difficult, but that significant cost savings can be realized along with locating much higher percentages of former students. Such efforts also provide at least tacit endorsement for expanding interagency collaboration to improve public policy in education, training, and human resource development.

Recommendations

The findings and conclusions from this analysis of thirteen states and their experiences with the UI wage record database suggest a number of recommendations. These recommendations can be grouped and discussed as actions needing to be taken by policy analysts and leaders, and potential initiatives for researchers.

Policy Development Concerns

At the federal and state level, a number of actions should be considered for expanding and improving the use of UI wage record data in vocational-technical education.

First, all State Directors of Vocational Education, in collaboration with their Committees of Practitioners, need to seriously consider using the UI wage record database as they formulate state systems of performance measures and standards. The evidence collected in this study suggests that the UI wage records contain useful information for judging whether or not graduates and former students are in the labor market and what their earnings look like. While the issue of whether or not their employment is related to the type of vocational education they received cannot be answered directly, it is possible to supplement the UI wage record data, as Florida has done, through sample and population surveys of employers to collect information describing job titles, location of employment, and perhaps employers' satisfaction with the training received. Beyond the UI wage record database, state directors and the agency staff should carefully examine possible data linking with systems of postsecondary and higher education institutions, as well as other federal databases (e.g., the Department of Defense, Postal Service, federal personnel). States that have linked with other databases have been able to successfully locate higher percentages of former students and acquire useful information describing their postprogram status (i.e., working, school, or both), geographic mobility, and income.

Second, state officials and local administrators need to develop high quality student record data. In order to access the UI wage record data and obtain useful analyses, social security numbers must be collected and recorded before students leave the program. Equally important, uniform definitions of vocational education programs, students (including age, gender, special student status), completers, leavers, and support services provided must be utilized. Without consistent and uniform data on program demographics, there are few possibilities for meaningful analysis. If comparisons are to be made on a statewide basis to identify programs or communities needing assistance, it is impossible to make that judgment unless the characteristics of the program or students are known. For example, one may find that urban vocational programs have lower employment rates than suburban vocational programs. To adequately interpret the meaning of such a finding, one must consider the ability levels of the students, the amount and type of vocational instruction and support services they received, the economic conditions of the community, and a host of other factors. Hence, it is important to recognize that access to UI wage records is only one aspect of using and interpreting the data appropriately.

Third, to reduce some of the administrative costs and to enhance the quality and comprehensiveness of the data set, states should consider forming regional consortia. These regional consortia, which should be modeled around natural labor markets, could develop interstate data-sharing agreements that would facilitate the building of comprehensive follow-up systems using UI wage records as well as other federal and state data systems.

Fourth, efforts are needed to improve the interpretative power of the UI wage record data. More specifically, states should develop special protocols for the SIC codes which allow the industry of employment data to match closely with specific vocational education programs completed by former students. The state of Washington has developed such a protocol. At the federal level, crosswalks need to be developed or refined which permit the SIC codes to be linked to appropriate codings for instructional programs such as the U.S. Department of Education's Classification of Instructional Programs (CIP).

Fifth, the U.S. Department of Education, in cooperation with other federal agencies, must provide greater leadership aimed at building greater awareness and utilization of the UI wage records and other automated databases toward effective evaluation of vocational-technical education programs. In June 1992, the National

Commission for Employment Policy recommended to the U.S. Department of Labor that the national methodology for performance standards in job training programs funded under JTPA be modified to incorporate the extensive use of UI wage data. In follow-up to this recommendation and other reports, the newly enacted Job Training Reform Amendments of 1992 will require the Commissioner of Labor Statistics to

> determine appropriate procedures for establishing a nationwide database containing information on quarterly earnings, establishment and industry affiliation, and geographic location of employment for all individuals for whom such information is collected by the States. (Section 405)

With leadership provided by the Department of Labor and other federal departments, it is imperative the Office of Vocational and Adult Education pursue similar efforts on an interdepartmental basis. More specifically, the pilot demonstration projects in several states or regional consortia of states should be considered and supported. These pilot demonstrations should incorporate many of the policy recommendations cited above and be rigorously evaluated in terms of their data quality, effectiveness in providing useful information for performance measures and standards, and cost effectiveness.

In addition, the Office of Vocational and Adult Education should be providing active support for pilot demonstrations through the sponsorship of conferences and workshops for appropriate state officials and local administrators, as well as the development of technical assistance guides and procedural manuals. In these efforts, states such as Florida and Washington who have developed sophisticated labor market monitoring systems should be highlighted. The various agencies involved in managing personnel data systems at the federal level should provide both encouragement and assistance to states in developing appropriate uses of this data if they expect to see definitive returns on the investment of federal funds for education, training, and economic development.

Research, Development, and Demonstration: Some Possibilities and Prototypes

The richness of the UI wage record data and its potential for use in assessing the quality and effects of vocational-technical education is, at best, only minimally understood by professionals, administrators, and policymakers. Responses to a wide variety of questions can be developed beyond those pertaining directly to the labor market performance of former students. Appendix C provides two tables illustrating studies or UI

wage record reports which would address state-level policy issues (Chart A) and local program improvement issues (Chart B). In each of these charts, the specific UI and educational data that should be linked via social security number are suggested. The comparisons or analyses to be drawn from the resulting data are indicated, along with potential uses of this information in policy development and program improvement.

State-level policymakers and legislators would likely find longitudinal and comprehensive analyses of the earnings and employment of vocational education students helpful in informing several public policy concerns. These include justifying funding increases and program approvals for high wage, high demand technical programs; balancing supply and demand for skills in specific industries; siting new programs for regional labor markets that are experiencing growth; planning new initiatives to reduce income differentials by gender and race; and informing employers, the general public, parents, and prospective students of the economic value of vocational-technical education programs. Other uses for these analyses could be improving financial aid policies for skills training, creating incentive programs for business and industry to invest in skills upgrading programs, and determining the appropriate level of public investment in vocational preparation at the secondary and postsecondary levels. Making these analyses will be dependent, of course, upon uniform statewide educational data which describe reliably the program of enrollment and other key information that enables informed recommendations to be drawn for policies regarding vocational education and economic development programs.

Demonstration projects should be undertaken by state boards of vocational education in collaboration with other state agencies (especially those agencies administering JTPA programs) and with support from the U.S. Department of Education, to develop and test the feasibility of linking statewide educational data to the UI wage records. As suggested by Chart A, this might include studies which examine a number of critical questions cited above. Further, demonstrations of the use of this data to address outcome questions will produce useful mechanisms for the state's system of performance measures and standards. At least one or two state demonstration initiatives should involve regional consortia. Regional demonstrations are of critical importance where major urban communities and regional labor markets span state boundaries (e.g., St. Louis, Kansas City, New York/New Jersey).

Local-level demonstrations of the UI wage record data systems are equally important for addressing the issues of continuous quality improvement. As school systems and postsecondary institutions move toward total quality management, the importance of informed data on the performance of students, graduates, and programs is crucial to effective decisions. Further, a broad array of local innovation and experimentation is the key to developing appropriate and optimally useful state-level data and information systems employing the UI wage records. State systems should, in large part, emerge from the most successful applications and demonstrations at the local level.

Chart B in Appendix C illustrates several management questions that should be addressed in local demonstration projects. To ensure that program and institutional accountability remains high, administrators need to know the extent to which their graduates are in the labor market, in training-related industries and occupations, as well as their earnings over an extended period of time. With uniform and comprehensive educational data, a number of other key questions can also be examined regarding specific innovative programs such as Tech Prep or Youth Apprenticeship. The important questions pertaining to earnings and employment and their relationships to overall academic achievement, financial aid, full- or part-time student status, and mobility of graduates can also be addressed. When compiled locally on the performance of former students, these reports provide invaluable insights for prospective students, parents, and high school guidance counselors who are advising students on the enrollment choices for secondary or postsecondary programs.

States considering the expanded use of UI wage records should support local demonstration projects. Among other funding sources, such projects could be supported from the federal Perkins allocation that each state receives for statewide leadership projects. State general purpose revenues and JTPA funds might also be allocated to demonstrate the impact of interagency cooperation.

Finally, it is imperative that the Department of Education provide mechanisms for monitoring and networking the various state and local UI wage record demonstrations. Such efforts coordinated through NCRVE, the National Occupational Information Coordinating Committee, or other appropriate organizations will enhance the development and exchange of effective practices, computer-based programs, and reporting formats.

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APPENDIX A
FEDERAL GUIDELINES FOR INCOME AND ELIGIBILITY VERIFICATION

States have a degree of latitude regarding what is included in its UI wage record file. Although minimum data requirements are established by the federal government, states are free to collect it in such a manner that meets their individual needs. In addition, some states collect more information than is required at the federal level. The following is excerpted from the U.S. Department of Labor's UIPL 47-86, describing the procedures to be used in collecting and processing the minimum income and eligibility verification under the Deficit Reduction Act of 1984 (P.L. 98-369). The following paragraphs and tables describe what might be available in individual states. Persons wanting greater detail of their state's system should contact their state UI agency.

Attachment to UIPL No. 47-86

I. Purpose

This document outlines the requirements and procedures for use of standardized formats as required by the income and eligibility verification procedures of the Deficit Reduction Act of 1984 (P.L. 98-369). The requirements, procedures, and formats are designed to provide uniform definitions, consistent data elements, and uniform standards to facilitate the exchange of information within and between states.

II. Authority

The Deficit Reduction Act of 1984 requires state agencies that administer the Aid to Families with Dependent Children (AFDC) program, the Adult Assistance programs (in the Territories), the Medicaid program, the Food Stamp program (FSP), and the Unemployment Compensation (UC) program to develop an Income and Eligibility Verification System (IEVS) meeting certain statutory requirements. Under the statute, state agencies "must adhere to standardized formats and procedures established by the Secretary of Health and Human Services (in consultation with the Secretary of Agriculture)" to exchange information to establish or verify eligibility. The final regulations implementing these requirements were issued on February 28, 1986 (51 FR 7178).

III. Requirements

A. The requirements of this section apply to state agencies administering the following programs:

1. The FSP under the Food Stamp Act of 1977, as amended;

2. The AFDC program under title IV-A of the Social Security Act; the Adult Assistance programs under titles I, X, XIV, and XVI (AABD) of the Social Security Act;

3. The Medicaid program under title XIX of the Social Security Act;

4. The UC program under title III of the Social Security Act; and

5. The State Wage Information Collection Agency receiving quarterly wage reports from employers as required by section 1137(a)(3) of the Social Security Act.

B. State agencies shall adhere to the following requirements when they exchange EVS information for purposes of conducting computer screens, computer matches, or other types of automated analyses to verify eligibility and benefit payments. These requirements must be reflected in any related agreements executed by the involved State agencies:

1. State agencies shall use the data element definitions included in the *Data Element Dictionary* for all exchanges and shall modify existing definitions to meet this requirement.

2. In responding to requests for data, State agencies shall provide an output record in the appropriate prescribed 480 character record, and shall include, at a minimum, all the critical data elements (those elements labeled "MUST NOT BE OMITTED" in the *Data Element Dictionary*); except that (1) agencies having existing exchange systems in operation may continue to use such systems so long as such exchanges are agreeable to both parties and the critical data elements are included, and (2) agencies establishing direct on-line access between requesting and responding agencies may develop

screens and output reports consistent with the capabilities of the medium so long as the critical data elements are included.

3. State agencies requesting information shall include sufficient data to identify individuals in the responding agency's files. At a minimum, this shall include the name and Social Security number of the individual for whom the exchange is being conducted; except that agencies shall accept information in the appropriate 480 character standardized format if requested to do so.

IV. Technical Documentation

The following tabs set forth the technical requirements established for state use in exchanging information for income and eligibility verification. Tab A sets forth the systems processing and exchange requirements the states must follow. Tabs B, C, and D present the standardized formats for data exchange among state public assistance agencies (Tab B), wage information collection agencies (Tab C), and unemployment compensation agencies (Tab D). Tab E contains the *Data Element Dictionary* and requirements. It includes a table of critical data elements, by the match record in which they appear. The data element number is included to provide a convenient cross-reference to the *Data Element Dictionary*. This table should help states identify the critical data elements and incorporate them into the state data exchange systems.

Standardized Formats

To facilitate the exchange of information between programs, standardized formats and data elements have been developed in the following three areas:

- Assistance Programs—Match Record Type 1
- Wage/Earnings—Match Record Type 2
- Compensation/Benefits—Match Record Type 3

The formats represent the complete file layouts and data elements needed to exchange information on clients from public assistance agencies, wage information collection agencies, and unemployment compensation agencies.

Each format contains the following four types of data elements:

- *Identifying information* assures the unique identity of the individual in the record. Basically, this information consists of name, Social Security number, address, agency case number, date of birth, and sex.

- *Case/Eligibility/Client data* includes information from the case record which is used to determine eligibility for and the amount of benefits.

- *Wage/Benefit/Resource information* includes the data from employers and programs needed to compare client reported information such as quarterly wages, employers, and unemployment insurance benefits.

- *Reports/Control information* to establish records controls or report conditions such as office numbers, codes, and match conditions.

TAB C: Wage/Earnings—Match Record Type 2 (MR-2)

The Wage/Earnings standardized format is prepared by the State Wage Information Collection Agency (SWICA) in response to a request from either a public assistance agency or an unemployment compensation agency. The Wage/Earnings format, file layout, and technical description are described in the pages following. The format contains information such as employer name, employer address, employee work location, and reported wages for the most recent available quarter and an additional four calendar quarters. For match hits that identify multiple employers, one full 480 character output record must be used for each employer. Some of the data elements included in the format are critical to properly develop the match. Other data, although not critical would enhance the ability of the requesting agency to process the matched data and conduct necessary verification activities and case actions.

WAGE/EARNINGS - MATCH RECORD TYPE 2

Fields To Be Printed for Selection Records

All Fields Unpacked
All Numeric DEs Unsigned

* Asterisks (*) are used to identify critical data elements.

Field Number	Field Description	Position First	Position Last	Field Length	Numeric Fields		
					Data Element Cross Reference	Alpha-Numeric?	Characters to Right of Decimal
1	SEEKER ID	1	1	1	40.01		0
2	Record Type*	2	2	1	40.02	YES	
3	SEEKER	3	5	3	40.13		0
4	Employer ID Number*	6	21	16	30.01	YES	
5	Active/Inactive Flag	22	22	1	30.02	YES	
6	Successor Flag	23	23	1	30.03	YES	
7	Filler	24	25	2		YES	
8	Century	26	27	2	10.02	YES	
9	DoB	28	33	6	10.03	YES	
10	SSN*	34	42	9	10.04	YES	
11	SSN Flag*	43	43	1	10.05	YES	
12	Sex	44	44	1	10.06	YES	
13	Filler	45	45	1		YES	
14	Health Insurance Carrier Flag	46	46	1	30.04	YES	

WAGE/EARNINGS - MATCH RECORD TYPE 2 (continued)

Field Number	Field Description	Position First	Position Last	Field Length	Numeric Fields		
					Data Element Cross Reference	Alpha-Numeric?	Characters to Right of Decimal
15	Employee Last Name*	47	62	16	10.07	YES	
16	Employee First Name	63	77	15	10.08	YES	
17	Employee Middle Initial	78	78	1	10.09	YES	
18	Filler	79	82	4		YES	
19	Employer Trade Name	83	112	30	30.05	YES	
20	Work Location Address	113	142	30	10.17	YES	
21	Work Location City	143	164	22	10.18	YES	
22	Work Location State	165	166	2	10.19	YES	
23	Work Location ZIP Code	167	171	5	10.20	YES	
24	Zip+4	172	175	4	10.20	YES	
25	Employer Phone Number 1	176	185	10	40.11	YES	
26	Employer Phone Number 2	186	195	10	40.11	YES	
27	Filler	196	196	1		YES	
28	File Date*	197	202	6	40.12	YES	
29	Employer Name*	203	232	30	30.06	YES	

WAGE/EARNINGS - MATCH RECORD TYPE 2 (continued)

Field Number	Field Description	Position First	Position Last	Field Length	Numeric Fields		
					Data Element Cross Reference	Alpha-Numeric?	Characters to Right of Decimal
30	Employer Street Address 1*	233	262	30	10.17	YES	
31	Employer Street Address 2*	263	292	30	10.17	YES	
32	Employer Street Address 3*	293	322	30	10.17	YES	
33	Employer Street Address 4*	323	352	30	10.17	YES	
34	City*	353	374	22	10.18	YES	
35	State*	375	376	2	10.19	YES	
36	Zip Code*	377	381	5	10.20	YES	
37	Zip+4	382	385	4	10.20	YES	
38	Quarter*	386	386	1	30.07	YES	
39	Year*	387	388	2	30.08	YES	
40	Quarter/Year*	389	391	3	30.09	YES	
41	Wages*	392	396	5	30.10		0
42	Type of Match	397	397	1	40.10	YES	
43	Requesting State FIPS Codes	398	399	2	40.08	YES	
44	Responding State FIPS Codes	400	401	2	40.08	YES	
45	Reserved for ES use	402	442	41		YES	
46	Health Insurance Carrier Number	443	447	5	30.13	YES	
47	Quarter/Year	448	450	3	30.09	YES	

WAGE/EARNINGS - MATCH RECORD TYPE 2 (continued)

Field Number	Field Description	Position First	Position Last	Field Length	Numeric Fields		
					Data Element Cross Reference	Alpha-Numeric?	Characters to Right of Decimal
48	Wages	451	455	5	30.10		0
49	Quarter/Year	456	458	3	30.09	YES	
50	Wages	459	462	5	30.10		0
51	Quarter/Year	464	466	3	30.04	YES	
52	Wages	467	471	5	30.10		0
53	Quarter/Year	472	474	3	30.09	YES	
54	Wages	475	479	5	30.10		0
55	Record Match Conditions*	480	480	1	40.09		

APPENDIX B
TELEPHONE INTERVIEW PROTOCOL

Review of State Summary

This ***draft*** summary will be included in the Technical Report as presented herein unless modified.

1. Is the enclosed statement an accurate and comprehensive overview of the various activities associated with UI wage record study or initiative in your state?

2. Do you have any additions, corrections, revisions, or refinements to offer or suggest?

State-Specific Questions

____ 1. The summary of your state is based upon information contained on an attached document. Have there been any new documents issued by your or any other state agency on the use of UI wage records as a tool for vocational education? Have any of the following documents been updated?

Comments:

____ 2. Do you anticipate any future activities in your state using the UI wage record data to follow-up clients of vocational education?

A. To what extent (or how) will the UI wage record data be used in the System of Performance Standards being developed and required under the Perkins Act?

B. Has the UI wage record data been discussed as a data source for new or expanded state educational accountability measures (e.g., school report cards)?

C. Have any eligible recipients (LEAs or Postsecondary Institutions) developed strategies for using the UI wage record data for local evaluation or assessment?

D. To what extent, if any, do you envision utilizing UI wage record data in consort with other training institutions/programs (JTPA, welfare, proprietary schools, corrections. . .)?

____ 3. As you look into the future over the next five years, what reasonable goals could your state agency adopt, if any, for the use of the UI wage record data on vocational-technical education?

Other States

Attached is the listing of the thirteen states that are included in our study. Are you aware or familiar with other significant activities in states that are not included on this list?

General Issues

Through our review of the literature and in conversations with others in the field, the following list of issues may or may not be of concern as vocational educators utilize the UI wage record system. Has your state addressed or considered these issues and, if so, how?

ISSUE	YES	NO
1. Personal assurances of confidentiality If yes, how?		
2. Reporting safeguards for confidentiality (e.g., minimum cell sizes) If yes, how?		
3. Employees not included in the UI Wage Record Data Base (e.g., self-employed workers) If yes, how?		

ISSUE	YES	NO
4. Reliability and accuracy of the UI Wage Record Data Base If yes, how?		
5. The relationship of Education/Training to Job Placement (e.g., CIP/SIC match) If yes, how?		
6. Availability of student social security numbers If yes, how?		
7. Uniform definitions of vocational education (e.g., programs, courses, and completers) If yes, how?		
8. Adding to the database (e.g., asking employers for additional information) If yes, how?		
9. Appropriate and useful comparisons (e.g., comparing data to other groups or to previous year's follow-up studies) If yes, how?		
10. Elimination or reduction of the existing follow-up studies or reporting systems If yes, how?		
11. Follow-up on nonmatched students in the UI Wage Record File If yes, how?		

ISSUE	YES	NO
12. Discussion with surrounding states to identify their residents working in your state If yes, how?		
13. Sub-state geographic analyses of the data If yes, how?		
14. Matching student record data with other databases (e.g., military, higher education, and federal personnel files) If yes, how?		
15. Comprehensiveness and quality of student records files (e.g., courses, test scores, and demographic information) If yes, how?		
16. Hours worked in the quarter—part-time versus full-time employment If yes, how?		
17. Interpreting data appropriately in light of economic and demographic conditions. If yes, how?		
18. Other issues:		

APPENDIX C
A FRAMEWORK FOR APPLICATIONS OF UI WAGE RECORD DATA TO ASSESSMENT IN VOCATIONAL-TECHNICAL EDUCATION

Chart A
State Policy Issues

Some Key Questions	UI Data	Educational Data	Comparisons/Analyses	Potential Uses of Information
• What are the general labor market effects of participating in vocational education?	• Earnings • Employment continuity • Industry	• Number of students completing specific programs (VE and non-VE) • Year of graduation	• Develop eight quarter earnings profiles for (1) VE grads & non-VE grads, (2) Male/female VE grads, and (3) Specific VE programs.	• Justify funding increases and program approvals for specific technical programs. • Increase sex equity initiatives in targeted industries and occupations.
• To what extent are graduates of high-tech programs mobile within and between states?	• County location of employment • Three-year earnings profiles • Number of different employers in three-year period • Interstate data sharing agreements	• Number of graduates of advanced technical skill programs over three-year period • Location of VE programs in which training was received	• Calculate interstate mobility rates for all graduates of high-tech programs. • Calculate in-state mobility rates (percentage of graduates who have one, two, three, or more employers in a three-year period) for new employers for graduates of high-tech programs. • Compare total number of graduates to occupational openings in each high-tech area for the SMSA or regional labor market.	• Develop or expand high tech training programs to reduce skill shortages and balance supply and demand for skills in specific industries. • Develop recruitment materials informing potential students of mobility and income demographics.

Chart A (continued)

Some Key Questions	UI Data	Educational Data	Comparisons/Analyses	Potential Uses of Information
• What are the economic effects of working while attending college for students with and without occupational skills and work experience? • What are the economic benefits to employers for investing in postsecondary technical education for current employees?	• Three-year income profiles for employees entering an industry without postsecondary education • Three-year income profiles for employees who are also attending college on a part- and full-time basis	• Amount and type of vocational education received in high school • High school diploma • Postsecondary enrollment status (part-time/full-time) • Postsecondary program title • Grade point average • Time required to complete postsecondary program	• Identify and contrast the dominant patterns of working and postsecondary schooling. • Compare postsecondary program with industry of employment to determine relatedness.	• Develop informational briefs for students and counselors describing the economic and educational benefits of combining school and work in specific technical fields. • Assist employers and trade associations in developing incentive programs for industry-related postsecondary education and training. • Develop financial aid programs for students who combine schooling and work.
• To what extent do graduates of vocational education programs have greater economic viability (e.g., higher incomes, less unemployment, and sustained employment)?	• Three-year earnings profiles for groups of secondary and postsecondary graduates and appropriate comparison groups. Profiles would be industry-specific.	• Secondary and postsecondary program titles • Time required to complete VE programs	• An adequate crosswalk for the SIC and CIP data would have to be created to determine whether or not students had taken training-related employment. • For specific industries or for specific VE programs, comparisons would be made on the following outcomes between program completers who entered training-related employment and contrast groups: (1) Continuity of employment (2) Eight-quarter earnings (3) Receipt of unemployment benefits (4) Job mobility (within and across industries)	• Develop requests for state funding for expanding needed vocational-technical education programs. • Encourage local administrators to initiate new vocational-technical programs likely to have positive long-term effects. • Develop and disseminate counseling materials and informational briefs for students on the positive long-term effects of specific technical programs.

Chart B

Local Program Improvement Issues

Some Key Questions	UI Data	Educational Data	Comparisons/Analyses	Potential Uses of Information
• To what extent does participation in Tech Prep programs increase earnings?	• Earnings following high school—eight-quarter summary	• List of students enrolled in a Tech Prep program for three-year period • List of Tech Prep graduates in a three-year period • List of high school graduates for a three-year period	• Contrast the median earnings of Tech Prep and non-Tech Prep graduates over a three-year period. • Contrast the median earnings of Tech Prep graduates and non-Tech Prep leavers during a three-year period.	• Make decisions relative to the expansion and funding of Tech Prep programs. • Add guidance and other support services to ensure that students complete Tech Prep programs. • Provide information to guidance counselors, students, and parents about comparative earning advantages for Tech Prep programs.
• Do program graduates who have higher grade point averages earn more?	• Eight-quarter earnings summaries for graduates of specific programs	• List of program graduates with grade point averages	• Develop a summary table listing average quarterly earnings for graduates with grade point averages in four to five ranges.	• Determine the extent to which earnings appear to be highly, moderately, or minimally related to grade point averages. If little or no relationship exists, convene specific studies and meetings with the program's advisory committee.
• How do the earnings of part-time and full-time students compare?	• Twelve-quarter earnings summary for the program enrollees and graduates	• List of part-time students and graduates • List of full-time students and graduates who were full-time students	• Examine the differences in mean quarterly earnings between part-time and full-time students and graduates.	• Develop program policies and financial aid policies (e.g., expanded work-study programs) which encourage appropriate mixes of employment and education.

Chart B (continued)

Some Key Questions	UI Data	Educational Data	Comparisons/Analyses	Potential Uses of Information
• To what extent are graduates mobile?	• County of employment	• List of program or institutional graduates for a five-year period	• Determine the five-year trends for graduates who are employed in (1) county of the program or institution; (2) the regional, multicounty labor market; and (3) other major labor markets within the state.	• Provide a "placement brief" for students in each program describing where graduates have obtained employment. • Plan and develop off-campus, regional workforce upgrading programs as appropriate.
• To what extent do program graduates obtain training-related jobs?	• Employment in training-related industries for an eight-quarter period	• Listing of program graduates for a two-year period. • Compile the occupation of employment for a twenty-five percent random sample of graduates via a telephone survey	• Determine the percentage of graduates entering occupations and industries considered program related.	• Use the information to phase out postsecondary programs that advisory committees determine have placement rates that are too low.
• How well do special needs students fare in employment following participation in vocational education programs?	• Eight-quarter profile of industry and earnings data	• List of special needs students who were completers and leavers for a five-year period	• Compare the eight-quarter earnings data for disadvantaged, handicapped, LEP, and nonspecial students by occupational program, school, gender, and completer versus leaver status.	• If data reveals lower earnings for leavers when compared to graduates, increase the support services to ensure higher completion rates.

APPENDIX D
STATES, DOCUMENTS AND CONTACT PERSONS

Alaska

Documents Reviewed:

"Employment Status and Earnings of Alaska Vocational Technical Center Training Program Graduates Completing Training in Fiscal Year 1988," Jeff Hadland, Economist, Alaska Department of Labor, June 30, 1990.

"A Comparison of Alaskan Female and Male Wage Income and Employment Patterns in 1988: The Gender Gap," Alaska Department of Labor, August 1990.

"Employment Status and Earnings of 1987 Vocational Program Completers, Martin Luther King Career Center, Anchorage, Alaska," JoAnn Wilson and Jeff Hadland, Alaska Department of Labor, and Flory Vinson, University of Alaska at Anchorage, September 6, 1991.

"Employment Status and Earnings of Alaska Vocational Technical Center Training Program Graduates Completing Training in Fiscal Year 1989," JoAnn Wilson and Jeff Hadland, Alaska Department of Labor, September 18, 1991.

Contact Person:

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Arizona

Document Reviewed:

"A Study of Public and Private Post Secondary Institution Vocational Education Program Completers," Robert V. Kerwood and Sid Borcher, Arizona Center for Vocational Education, Center for Excellence in Education, Northern Arizona University, Flagstaff, Arizona, June 1986.

Contact Person:

Mr. Ted Davis
Arizona Department of Education
1535 W. Jefferson
Phoenix, AZ 85007
(602) 542-5566

Colorado

Documents Reviewed:

"A Longitudinal Tracking Study of Short-Term Education and Employment Outcomes of Colorado Community College Graduates," Gregory P. Smith, Colorado Community College and Occupational Education System, December 6, 1989.

"Colorado Commission on Higher Education Accountability Newsletter," May 1991.

Colorado House Bill No. 1187.

Contact Person:

Gregory P. Smith, Coordinator of Institutional Research and Evaluation
Colorado Community College and Occupational Education System
1391 N. Speer Boulevard, Suite 600
Denver, CO 80204-2554
(303) 620-4034

Florida

Documents Reviewed:

"Florida Education and Training Placement Information Program, 1988-1989 Summary of Findings," Annual Report, Florida Department of Education, May 1989.

"Florida Education and Training Placement Information Program," Annual Report, Florida Department of Education, August 1990.

Contact Person:

Jay J. Pfeiffer, Systems Project Director
Florida Educational and Training Placement Information Program
137 W. Gaines St.
Tallahassee, FL 32399
(904) 487-0900

Illinois

Documents Reviewed:

"A Primer on the Employment Tracking System," Illinois Department of Employment Security.

"Employment Tracking System: User Guide," Illinois Department of Employment Security.

"On-The-Job Training Programs in JTPA: A Quality of Service Report to the Illinois Job Training Coordinating Council," Illinois Department of Commerce and Community Affairs, October 24, 1990.

Contact Person:

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Department of Adult, Vocational, and Technical Education
Illinois State Board of Education
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Indiana

Documents Reviewed:

Agenda Items from May 11, 1989, and June 7, 1990, Meetings of the Indiana Commission on Vocational and Technical Education.

Contact Person:

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Missouri

Documents Reviewed:

"The Longitudinal Follow-up of 1981 Missouri High School Graduate," Final Report, Missouri Testing and Evaluation Service, College of Education, University of Missouri at Columbia, October 1987.

"The Effectiveness Index Formula For Incentive Funding," Missouri Department of Elementary and Secondary Education.

"Employment Security Report 1981-1986," Missouri Division of Employment Security.

Contact Person:

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Box 480
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New Hampshire

Document Reviewed:

"Working and Schooling Decision: A Study of New Hampshire Teenage Labor Market Behavior and the Level of Educational Attainment," Third Report of "The School-to-Work Transition: The Role of Unemployment Insurance Wage Credit Records in Longitudinally Tracking Youth from School to Work," New Hampshire Employment Security, June 1991.

Contact Person:

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Concord, NH 033012
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Oklahoma

Document Reviewed:

"Using Employer Wage Records To Determine Vocational Completer Labor Market Outcomes," Richard C. Makin and Curtis G. Shumaker, Oklahoma Department of Vocational and Technical Education and the Oklahoma Occupational Information Coordinating Committee, August 22, 1990.

Contact Person:

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(405) 743-5198

Texas

Documents Reviewed:

"Quarterly Employment Tracking System: Unemployment Insurance Wage Record Feasibility Study and Pilot Test Project," Final Report, Texas Occupational Information Coordinating Committee and Andersen Consulting, Austin, Texas, July 1990.

"Pilot Study Findings of the Use of the Texas Employment Commission Unemployment Insurance Wage Records to Document Outcomes of Technical-Vocational Education and Training," Texas Higher Education Coordinating Board, Austin, Texas, May 1991.

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Virginia

Document Reviewed:

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Washington

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